BRITISH MEDICAL JOURNAL

LONDON: SATURDAY, OCTOBER 12th, 1935

THE PSYCHOSES OF ADOLESCENCE*

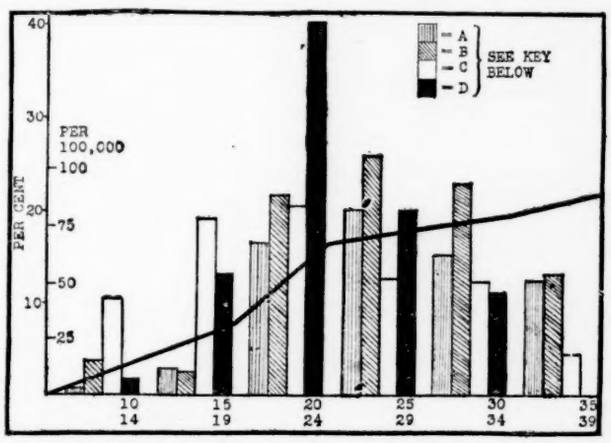
BY

W. S. DAWSON, M.A., M.D.Oxon, F.R.C.P.Lond.

LECTURER IN PSYCHIATRY, UNIVERSITY OF SYDNEY

The subject chosen for this discussion is of importance not so much by reason of the total number of cases occurring at this age period, but because it is during adolescence that appear the first manifestations of two outstanding clinical syndromes, the more pronounced examples of which form a considerable proportion of the population of our mental hospitals, while milder forms are far from uncommon in out-patient and general practice.

It will be seen from the diagram below that the incidence of psychoses rises from the age of 15, before which time insanities are infrequent. On the other hand, the history of some adolescent psychoses indicates that a change in disposition may occur several years before hospitalization becomes necessary. To this extent official statistics tend both to minimize the duration of attacks and to overestimate the age of onset. After the age of 20 the insanity rate continues to rise more gradually. It will be noted, further, that the manic-depressive psychosis and dementia praecox show a maximum incidence at an age of onset between the age of 20 and 25. Although epilepsy and delinquency are not psychoses it is interesting to observe that the former, presumably constitutional in nature, and the latter, in which social factors play no inconsiderable part, both display an age incidence which is remarkably similar to that of the psychoses, all of which points to a heightened instability at this period. Biological causes are doubtless at work in delinquency as well as in other deviations from conventional behaviour.



A, First attacks of manic-depressive psychosis (Kraepelin).
B, Age of onset of dementia praecox (Kraepelin).
C, First attacks of epilepsy, not including infantile convulsions (Kraepelin).
D, Age at first conviction of 2,204 habitual offenders (Burt).
The continuous black line indicates the rate of incidence of insanity per 100,000 of the population living (Robertson).

Physical and Mental Changes of Adolescence

During adolescence the body attains its maximum height, and "filling out" takes the place of linear development. The brain reaches its maximum capacity at 16 years, an age which is accepted by psychologists as marking the termination of the growth of intelligence, although doubtless in the bulk of mankind there still proceeds organization of nervous structures and an improvement in efficiency of reaction. During this period there is increased activity of the endocrine system, in which the thyroid, the pituitary, the gonads, and probably the adrenal glands are affected. This provides the organic substratum for the profound changes in behaviour exhibited by the adolescent. Above all, the maturing of the sexual apparatus, including the appearance of secondary sexual characteristics, is responsible for urges of far-reaching significance. Whatever interpretation we may care to place on activities in the sexual organs in early life, the maturation of sex in its biological sense can hardly be said to begin before the onset of certain physical changes, and does not attain full development before the third decade.

The brain should normally assume control of the vegetative mechanisms concerned with the life of internal relation, and should function as the arbitrator between inner urges and stimuli derived from the exterior, expressed in psychological terms as the conflict between self and society. It is probable that some forms of adolescent instability are due to unequal development of the controlling and impulsive mechanisms. Physique may outgrow prudence, intellect may outstep initiative. At this stage our knowledge of what goes on inside fails us—there are too many missing members in the chain between mental and physical, so that we must be content with description in general terms. In discussing the psychology of adolescence, we enter a field in which the novelist and the dramatist have up to quite recent times displayed greater understanding than the professional student of mankind. Accompanying the physiological unrest there is also an emotional disturbance closely related to the transition from egocentricity to altruism, involving in some individuals a sense of self-sacrifice, the comparative and the morbid psychology of which have been investigated by Jung. Keyserling[1] has made some interesting comments on the psychology of adolescence:

* Read in opening a discussion in the Section of Neurology and Psychological Medicine at the Annual Meeting of the British Medical Association, Melbourne, 1935.

"In order to get the right start, let us recall what was said about youthful idealism: it is essentially an idealism without an object, because the supposed-to-be object really only means a projection of the inner urge. For this reason the objectified ideals of youth can never be taken seriously if they are meant to represent more than ideals for the young. But in the same sense youth is, generally speaking, the most uninteresting phase in human life. The period of youthful *Sturm und Drang* which older people are so apt to relate to spiritual values is, for the most part, a result of typical organic processes; and youth's ambition, too, is a natural physiological phenomenon. It is likewise the result of physiological, and therefore unalterable, causes that its interest in problems belongs more to the intellect alone, reflected in emotions and feelings, than to the whole personality; youth is never psychologically integrated; the various constituents of the soul play almost independent parts. Accordingly, its interest in problems is always a mental and not a vital interest. This is why the idealist is generally considered as unpractical and lacking in common sense: his ideals are not correlated to the other functions of his psychic organism. This also explains why the idealist usually is a hopeless radical: lacking the above-mentioned correlation, there is nothing to prevent his thoughts from following their own laws only, and the laws of abstract thought are purely logical: the pragmatic test does not apply to them. Accordingly, a young person can be rightly judged only when considered as a being in the state of development. It follows that the real and basic value of youth lies in its plasticity as such, and that only this plasticity can provide a true standard of value. It has nothing to do with any kind of contents. It follows, further, that youth loses not only its chief, but its one asset, if it loses its plasticity. . . ."

Youth should be full of effort. The quiet, passive adolescent is the one who seems most likely to develop the more serious psychosis. Erotic manifestations, provided they are kept within bounds, are less subject to repression and reprobation in these more discerning days. As Clouston[2] pointed out: "The highest moral qualities, the keenest yearnings after the good, the intensest hatred and scorn of evil are not to be found in the asexual men or women."

Classification

The psychoses of adolescence comprise the following, which, of course, are not restricted to this age period, but which, as regards the circumstances of their onset and their symptomatology, may present more or less distinctive features:

(*a*) *Organic group:*
- Confusional psychosis.
- Psychoses associated with epidemic encephalitis, general paralysis, and epilepsy.

(*b*) *Biogenic or functional group:*
- Manic-depressive psychosis.
- Dementia praecox or schizophrenia.

Confusional Psychosis

Apart from the delirium which may accompany an acute infective illness, the more lengthy clouding of consciousness which goes by the name of confusion is not a common occurrence in adolescence. Jones and Minogue[3] found that its greatest incidence is between the ages of 30 and 60 in men, with alcohol as an outstanding factor, and between 20 and 50 in women, in whom alcohol and child-bearing—especially the puerperium with its toxic disorders—are of about equal importance in the aetiology. Alcoholic indulgence is less frequent and less severe in adolescence, and years of excess have not had time to exert their cumulative effects. Further, more hygienic methods of living and greater attention to the care and culture of the body tend to eliminate certain physical factors. The days of the apprentice who worked long hours at his trade by day and sacrificed his sleep to study are over. Rarely does one find intense mental application as an outstanding factor in confusional or other psychoses without some emotional basis. More often there is a history of more or less futile attempts on the part of the patient to grasp what is beyond his capacity, followed by disappointment and impairment of sleep, appetite, and general condition, leading on to exhaustion.

The acute confusional psychosis usually occurs in an individual who has displayed no outstanding psychopathic features in his make-up, and a history of exceptional or prolonged physical or mental stress may usually be obtained. In the earlier stages and in mild cases throughout the illness there is a subjective awareness of difficulty in concentration, and it is obvious to observers that attention is directed with distinct effort and is rarely sustained. There is often an appearance of perplexity. Impairment of awareness of the environment is responsible for the suspicion which is exhibited regarding the actions of others. An excellent illustration is the description of Ophelia (*Hamlet*, Act IV, Scene 5). In the fully developed psychosis the clouding of consciousness involves a gross defect of recent and remote memory, and a reduced and distorted awareness of temporal and spatial relationships. The emotional tone is apt to be variable, but action and speech, and the hallucinations which are almost invariably present, are in accordance with the mood of the moment.

The impairment of contact with environment is usually sufficiently obvious in patients who talk. In those who are silent and inaccessible a diagnosis from melancholia may not be easy. In either case the prognosis is favourable. Some confusional cases exhibit catalepsy, with a tendency to assume attitudes and perform antics and to retain postures which have been imposed on them by others (flexibilitas cerea). In the absence of any morbidly introvert traits in the ordinary personality of the patient, with a fairly rapid onset, and with clear evidence of physical or mental stress, return to normality is still likely. Occasionally one sees residual mental impairment after a severe delirium or confusion.

Epidemic Encephalitis

Closely associated with the confusional group are the mental disturbances of acute encephalitis, taking usually the form of a drowsy delirium, sometimes of the "occupational" type, with hallucinations—perhaps more often illusions—of various senses. The patient is apt to complain of curious distortions of vision, for which internal and external ophthalmoplegia may be held responsible. Pyrexia, cranial nerve palsies, transient or sustained involvement of the pyramidal and pre-pyramidal systems, together with pathological changes in the cerebro-spinal fluid, will exclude a stupor of hysterical or psychotic origin. Where neurological signs are less evident, the previous personality of the patient, the mode and circumstances of onset of the stupor, and its duration, should be taken into account. In the delirium of encephalitis the patient can usually be roused, though with some protest on his part, to a temporary contact with his environment, while in psychotic stupor there is either a passive failure to respond or else an active, determined resistance to examination. In childhood and adolescence the higher centres are more vulnerable to the virus of encephalitis, so that we occasionally see that interesting but cruel experiment of nature whereby a profound alteration of character follows this particular form of cerebral infection. Although, as in neurosyphilis, actual dementia may occur, the striking features are deterioration of moral sense and the proneness to impulsive violence which are uncommon in juvenile paresis. These

mental changes are not so frequently associated with neurological sequels.

Difficulty may be experienced in differentiating Parkinsonism, melancholia, and katatonia (dementia praecox). Increasing fatigability and sense of effort, together with moderate depression, encourage a tentative diagnosis of neurasthenia or mild melancholia. With the establishment of more definitely Parkinsonian signs the depression rarely becomes more intense, and, on the contrary, more often gives place to a complacent attitude, which acts as a fortunate compensation for the physical disability. A pronounced slowing of thought and movement with but slight depression should not tempt the physician to the more optimistic diagnosis of melancholia without a careful examination for signs of a pre-pyramidal disorder.

A moderate degree of Parkinsonism in an adolescent, together with deterioration of sentiments, impulsive behaviour, restlessness, and the loss of interest which goes with the sluggish mentality of this syndrome, may be mistaken for katatonia. Here again attention to the previous personality of the patient and to the mode of onset of unusual mental features is of assistance, while as regards the actual clinical condition there should be noted an absence of the hallucinations, delusions, and oddities of behaviour, including negativism (active resistance to contact with the environment), which are invariable features in the katatonic variety of dementia praecox. In fact, the association of a true psychosis with epidemic encephalitis in either the acute or chronic stages is remarkably infrequent.

Juvenile general paralysis accounts for a small proportion of the psychoses of adolescence; the mental symptoms often resemble those present in dementia praecox.

Dementia Praecox

In 1860 Morel, who appears to have been the first to employ the term, described a *démence précoce* in a boy of 14. A little later Kahlbaum gave the name hebephrenia to psychic decline occurring at puberty, and in 1871 appeared Hecker's celebrated monograph in which were given as the outstanding features of this condition: onset at puberty, and progress to mental deterioration through phases of excitement, depression, or confusion.

In 1874 Kahlbaum noted the association of certain mental symptoms with disturbance of the voluntary motor system in adolescents, which he termed katatonia (*Spannungsirresein* or tension psychosis). In the symptomatology he referred to epileptiform attacks, mutism, states of ecstasy, stilted speech, and waxy flexibility. He also stated that these patients might either recover or dement. In his *Neuroses of Development* (1891) Clouston did not attempt any clear definition of the insanities of adolescence, and ignored the German writers, though he stressed the hereditary basis ("the most hereditary of all insanities"), and estimated that recovery occurred in 60 per cent. of cases, with dementia in the remainder. At about the same time Kraepelin began to elaborate his classification of the "functional" psychoses on a basis of aetiology, course, and outcome, out of which he evolved the recoverable manic-depressive and chronic dementia praecox groups, adding to the latter dementia paranoides and katatonia (*Psychiatrie*, fifth edition, 1896).

According to Kraepelin the diagnostic features of dementia praecox are: weakening of emotion, lack of congruity between thought, mood, and action, and a tendency to intellectual deterioration. The curious distortion of the association of ideas, and the general lack of system in the various mental activities which is generally regarded as a prominent feature in dementia praecox, has been emphasized by Wernicke ("dementia sejunctiva," 1900), Stransky ("intrapsychic atoxia," 1909), and Bleuler ("schizophrenia," 1911).

In 1906 Adolf Meyer[1] gave his formulation of dementia praecox to the Toronto meeting of the British Medical Association, and opened new avenues to the understanding of this condition. Beyond reference to hereditary antecedents and to the presence in childhood of some patients of mental qualities similar to those of adult cases with incomplete remissions (shyness, sensitiveness, docility, disinclination for activity, instability), Kraepelin and others had paid little attention to the type of personality of individuals who develop dementia praecox. In fact, but for the diagnostic importance of progressive intellectual failure in some cases only determined after years of observation, Kraepelin's conception may be regarded as essentially static and singularly unfortunate for those patients for whom nothing more is done than to attach a diagnosis which conforms to Kraepelinian rules.

Since Meyer has recently declared that the Toronto paper still represents his views on the subject, some of his main points may be recalled. In the first place, he emphasizes the importance of making a distinction between fundamental and incidental symptoms. As fundamental in dementia praecox he points to the lack of adaptability displayed by many patients before the recognition of the actual psychosis, which he suggests may be due to a deterioration of habits.

"The main principle is that many individuals cannot afford to count on unlimited elasticity in the habitual use of certain habits of adjustment, that instincts will be undermined by persistent misapplication, and the delicate balance of mental adjustment and of its material substratum must largely depend on a maintenance of sound instinct and reaction type."

Secondly, Meyer discourages the emphasis on dementia. Already the scientific prescription of occupation, selected and controlled as far as possible to meet the needs of individual cases, has shown that part at least of the symptomatology of dementia praecox is due to a deterioration of conduct which is not beyond remedy. The opinion is also expressed by Meyer that the varieties of which Kraepelin originally described four, but finally eleven, will "claim less attention with the growth of knowledge concerning the essential nature of dementia praecox." Between those who become uneventfully stupid and those whose psychic decline is adorned by a wealth of symbolic fantasy there is a motley group with a constantly changing picture of excitements and inhibitions. Those cases which "in their time play many parts" no doubt invite diagnostic finesse, but the final decision must rest on fundamental points.

Since Meyer wrote "there is not much definition yet about the histological process which is the structural expression of the deterioration," much attention has been paid to the pathology of the neurone. After thirty years we may still agree that "its slightness suggests a mere bankruptcy under anomalous or even ordinary demands, with insufficient funds of adjustment. Many forms are so acute that they suggest a histologically well defined crisis, but the data are still too slender." As will be seen later a similar interpretation may be given to the results of research conducted along lines which were hardly envisaged in 1906.

While admitting a difficulty in defining the precise boundary between normality and psychopathy Meyer and his pupils have attempted to formulate in some detail those traits which appear most frequently in the histories of the personalities of cases before the development of actual psychosis. We are indebted to American psychiatry for common-sense and practical descriptions which are refreshingly free from the obscurities of certain European schools. For example, August Hoch pointed out:

"We find in dementia praecox persons who have not a natural tendency to be open and to get into contact with their environments, who are reticent, seclusive, who cannot adapt themselves to a situation, who are hard to influence, often sensitive and stubborn, but the latter more passive than in an active way. They show little interest in what goes on, often do not participate in the pleasures, cares, and pursuits of those around them; although often sensitive, they do not let others know what their conflicts are, do not unburden their minds, are shy, and have a tendency to live in a world of fancies."

The history of a personality which is inadequate in the emotional rather than in the more purely intellectual field is sufficiently common to be significant. How far the "fixation" of the Freudian school and the "regression" suggested by Jung—whatever their descriptive value—throw any light on the essential nature of dementia praecox will no doubt engage the attention of this meeting. With the acquisition and correlation of more data concerning human development in both its physiological and its psychological aspects there will surely be evolved a less fanciful measure of maturation than the Freudian instrument. Nevertheless, it would be less than just to overlook the vitalizing effect of the Freudian movement upon the study of the dynamic aspects of psychopathology.

It is not hard to understand how introvert qualities become accentuated to a degree that seriously threatens the capacity for normal adaptation. In these sensitive and self-centred individuals character development is liable to be stunted through the absence of social contacts, the rivalries and the struggles for self-expression which should comprise the essence of normal activity. Hence it comes about that the most trivial failure, the merest decline from quite exceptional ideals, throw the adolescent more into himself and add yet another bar to his self-constructed prison. Unhealthy ruminations, sexual perversions, devotion to abstract study, religious exercises which savour more of self-gratification or of a maudlin penance ("frothy, sentimental religionism" of Clouston), are some of the undesirable accretions of introversion. Many of us have learned to hear with dismay the praises sung by the parents of some of our adolescent psychotics: "He was always such a good lad, he never gave us any trouble"; "he is so studious and serious-minded; he spends hours over books on philosophy and psychology."

It is important to draw a distinction between the life of retirement and self-denial which is creative, and the type now under discussion, which is merely indulgent, essentially effortless, and futile. For a time there may be success in a narrow scholastic field, but one which is rarely maintained with the backing of a solid, well-developed personality. Hence we see not infrequently a disintegration of personality apparently initiated by a failure to accept responsibility, or by some shortcoming in the field of emotion and sentiment rather than of knowledge and intellect.

References may be made to some possible influences in the upbringing of cases of dementia praecox. McGeorge[5] is impressed by the number of disciplinarian repressive parents whom he terms "schizogenic." Kasanin[6] points out that the inferiorities of the schizophrenic child invite a protective attitude on the part of parents; hence, emotional development and capacity for independence are discouraged. Perhaps one more often finds that these children are subjected to a conflict of disciplines to maternal solicitude and to intolerance and discouragement by the father, who has no patience with a weakling. Admittedly one also sees cases in which the parents have long recognized and dealt with these inadequacies according to sound psychiatric principles, but without success.

The Manic-depressive Psychosis

Out of the states of excitement and depression, mania, and melancholia, which have been recognized from classical times, Kraepelin evolved his concept of a syndrome characterized by a predominant affect occurring as a phase, or attack, with return to normality, but with a liability to relapse after an indefinite period. Many cases preserve unimpaired mentality in spite of numerous attacks. As in dementia praecox, there is a hereditary and constitutional background, and the incidence of first attacks is greatest in adolescence and early adult life. In the pre-psychotic personality there is often evidence of depressive and hypochondriacal trends or of other manifestations of instability, whereby the patient has usually been regarded by his parents as a "nervous" child. Occasionally we are told of a shyness, seclusiveness, or obstinacy which is more in keeping with a schizoid constitution. In a series of cases with depressions of all intensities, but without a schizophrenic symptomatology, I found that a third had a history which pointed to marked introversion. Until there is more continuity of trained observation of the nervous child up to maturity, the retrospective assessment of morbid features will remain obscure and full of error, and fundamentals and incidentals will be hopelessly confused.

The symptomatology of the manic-depressive psychosis in adolescence does not differ materially from that presented by adult cases, except that the patient refers more commonly to mind and body than to estate. Hypochondriacal complaints and fears in depression, an exaggerated egotism, and over-confidence of personal capacity, with intolerance of discipline and erotic trends in mania, are typical features of this psychosis in adolescence. Each case presents a variety of symptoms, which are determined by upbringing and personal interests and experiences, and which are of less diagnostic importance than the occurrence of a sustained exaggeration of affect in the direction of depression or elation with consistent ideation and conduct.

The recognition of these two syndromes—dementia praecox and the manic-depressive psychosis—the former characterized by oddities and inconsistencies and a marked tendency to chronicity, the latter by the relatively benign occurrence of a periodic exaggeration of mood, is a landmark in psychiatry. Unfortunately, there are many cases which refuse to be pigeon-holed into one or other category. In this connexion most will agree that Kretschmer's correlations between physique, temperament, and psychosis hold good only for a certain proportion of "functional" psychotics, the remainder displaying features which partake of all his types. Between the cases displaying clear-cut exaggerations of mood with accordant thought and conduct and those with the insidiously developing inconsistency, variability, and apathy which we term "dementia praecox" are the mixed forms which provoke our diagnostic and prognostic acumen.

Many of our difficulties no doubt arise from an adherence to a faculty psychology which has outlived its utility, so that exaggerated importance is attached to a minute analysis of ideation and behaviour. The mere observation that a patient is suspicious or impulsive is comparatively valueless without reference to personality and circumstances. Perhaps the most important advances in the understanding of the biogenic psychoses during the past three decades have resulted from a shifting of emphasis from symptoms to personality. From the prognostic standpoint it may be accepted that the more "normal" the individual, the richer his interests; the greater the physical or mental stresses, before the development of the psychosis, and the more rapid the onset of mental symptoms, the better the outlook.

Pathology of the Psychoses of Adolescence

With the development of neuro-histological technique the experience derived from the study of general paralysis and other clearly organic conditions has been applied to the biogenic or functional syndromes. Changes in the brain in dementia praecox have been described by Nissl and Alzheimer among earlier workers, and more recently by Mott, Dunlap, and Spielmeyer. Briefly, cases of long standing show thickening of the meninges and

destruction of cells in the deeper layers of the cortex, with moderate gliosis, but with minimal involvement of the tangential and other connecting systems. More recent and acute cases have revealed evidence of metabolic disorders in the neuroses, such as eccentricity of the nuclei and varying degrees of disintegration of Nissl substance, accumulation of lipoid, and an abnormally acidophil staining. Dunlap, after comparison with control tissues, failed to satisfy himself that some of the changes described were pathological, while others, he suggested, might be due to intercurrent physical diseases, such as respiratory infections, or to unknown factors. Spielmeyer has provided further evidence in favour of the intoxication origin of the cell changes, and has also pointed out that actual destruction of cells is a feature of other psychoses which are more clearly organic, so that while there appears to be a neuropathology in dementia praecox it is not yet possible to claim any specificity in the nature of the cell changes. The manic-depressive and schizophrenic psychoses can hardly be considered fatal in themselves, although these disorders of behaviour invite respiratory and other infections, and life may be endangered through exhaustion. Pathological changes which are due to such complications can be excluded only by the examination of material from patients with recent psychosis dead through violence.

Mott's interpretation of the brain pathology as evidence of deficient oxidation, and the clinical indications of defective psycho-sexual development, led him to investigate the endocrine system, where he found degenerative changes in the gonads (regressive atrophy), pituitary, and adrenal bodies, and to a lesser extent in the thyroid glands. His findings have either not been substantiated by other workers or have been found only in a certain proportion of cases. Here again the same fallacies need to be excluded as in the pathology of the brain. Clinically, the exhibition of thyroid and other glandular extracts has not been proved above doubt to be of therapeutic value. Further, with the possible exception of the thyroid, destruction or removal of endocrine glands (for example, castration) is not followed by unequivocally schizophrenic or manic-depressive features.

Mott's work on the cellular pathology of dementia praecox, which he held to be due to an innate lack of vitality, has been carried a stage further by Golla and his associates in their studies of biochemical reactions, including carbohydrate and basal metabolism and urinary and respiratory responses, which point to a hyperacidity of the tissues, a condition which is present normally during sleep, and which may be referred to a depression of the centres controlling respiration. There has thus been afforded on the biochemical side a possible explanation for the morbid inertia which is such a striking clinical feature of well-established cases of schizophrenia. Nevertheless, we remain in doubt as to how far these biochemical reactions are constitutional anomalies, specific to these psychoses, due to infections or other acquired factors, or merely the sequel rather than the cause of a reduction of activity. Loevenhart and others, by employing inhalations of oxygen and carbon dioxide, increasing the latter from 10 up to about 40 per cent., have produced a transient accessibility and comparative normality in patients who have long been mute and detached from their environment. Paradoxically, good results are also claimed for prolonged narcosis under sedative drugs

Any discussions on the pathology of the biogenic psychoses would be incomplete without reference to the work of Zondek on the bromine content of the blood and the cerebro-spinal fluid in manic-depressives, which he maintains is fairly consistently below normal during the attack. Zondek has also found that the bromine content of the hypothalamus is three times as great as that of other portions of the brain, and that it is higher in the anterior than in the middle and posterior sections of the pituitary gland. It has yet to be shown whether these findings have any connexion with the vegetative and metabolic disturbances observed in these psychoses. Those of us who incline to the view that the manic-depressive and schizophrenic syndromes are not mutually exclusive find it difficult to accept Zondek's findings as specific.

Treatment

Whatever may be the significance of biochemical or other physical deviations from the average in the psychoses, the means for their correction are not yet available, so that these links with the more clearly organic provide no justification for any relaxation in our present methods of treatment. Here it may be stated that the possession of a psychosis does not entitle a patient to a degree of surgical intervention which would not be justified in a sane individual. The increasing provision of public facilities for treatment, and the better understanding on the part of the general medical practitioner of these cases, leading to earlier recognition, will, it is hoped, be reflected in a lower incidence of institutional cases. And in this connexion it may be observed that purely institutional experience tends to foster an unwarrantably pessimistic attitude towards prognosis, especially in the schizophrenic series, taking no account of the slighter cases that remain in their own homes. Indeed, unless institutional care allows for some degree of individualization it had better be postponed in many schizophrenics.

However much we may have advanced in detail, increased knowledge has not encouraged us to depart from the principles laid down by Clouston in 1891—namely, to "build up the bone and fat and muscle" and "rather restrain the imaginative and artistic faculties and sensitiveness and idealisms generally, in the cases where such tend to appear too early and too keenly. . . . Cultivate and insist on orderliness and method in all things." Handicrafts to provide the means for self-expression and the satisfaction of achievement, recreation in groups to encourage sociability, and the maintenance of psychological contact between physician and patient are important aspects of treatment. Using Hughlings Jackson's phrase, there is usually some "intact remainder" to work upon, and however unpromising the outlook it is better to treat the patient for what he is than to neglect him for what he may become. Finally, the recognition and correlation of anomalies of character and temperament during the school years, and the examination of the children of psychotic parents, offer a possibility of preventing or arresting more serious mental abnormalities.

References

[1] Keyserling, Count: *America Set Free*, 1925.
[2] Clouston: *Neuroses of Development*, 1891.
[3] Jones and Minogue: *Trans. Australasian Med. Congress*, 1930.
[4] Meyer, A.: *British Medical Journal*, September 29th, 1906.
[5] McGeorge: *Med. Journ. of Australia*, 1932, ii.
[6] Kasanin: *Journ. Nerv. and Ment. Dis.*, March, 1934, lxxix.

(Further references will be found in Devine: *Recent Advances in Psychiatry*, second edition, 1933.)

The verbatim report of the twenty-first annual conference of the National Association for the Prevention of Tuberculosis has now been published, and copies may be purchased at 7s. 6d. each, post free. Orders should be addressed to the secretary of the N.A.P.T., Tavistock House North, Tavistock Square, London, W.C.

THE REMOTE RESULTS OF PUERPERAL SEPSIS *

BY

SIR EWEN MACLEAN, M.D., D.Sc., F.R.C.P., F.C.O.G.

EMERITUS PROFESSOR OF OBSTETRICS AND GYNAECOLOGY, WELSH NATIONAL SCHOOL OF MEDICINE, CARDIFF

We have been invited by the officers of our Section to present and to discuss the relatively undefined problem of the remote results of puerperal sepsis. Investigations have been so largely concerned the world over with the tragical question of maternal mortality and the computation of its prevalence that the systematic "follow-up" of non-fatal cases of puerperal infection—and they are, of course, the majority—into the immensity of the area of puerperal morbidity has been comparatively neglected. The difficulties in arriving at concise data are great enough as regards maternal mortality, but they are greater still in relation to morbidity.

There are signs of a widespread desire that this neglect should be repaired, and it would seem to be opportune to enter a plea for, so far as may be, an international scheme of investigation, and for representations to that effect to be made to the Health Organization of the League of Nations. Such help as may be gained by deductions made from international figures arrived at on the basis of a common form of inquiry would thus be more readily available, and the unhappy experience of those who for years have been searching for reliable information as to comparative national rates of maternal mortality would be avoided. The action which the League has taken towards standardizing the make-up of the mortality rates has been widely acclaimed, and has already had good results.

So far as the records relating to health insurance are concerned, it would be some consolation to panel practitioners if they could be assured that their scriptorial duties for approved societies and health departments were used for some scientific and social ends. For our present purposes I have explored the possibility of returns concerning maternity benefit and sickness benefit of insured women showing the incidence and later results of puerperal infection. Dr. McKinlay of the Department of Health for Scotland most courteously furnished me with some interesting figures dealing, as closely as might be, with the subject. But after analysis the deductions which could then be made in the direction of our main purpose were practically valueless. I tested the returns of some of the larger approved societies with a similar result. I was assured, however, that it would be possible so to amend those relating to maternity benefit and any subsequent illnesses as to furnish a useful follow-up. This is a consideration which it may be well to keep in mind.

The significance of the term "remote" in the title of our discussion is, presumably, to be taken, not in the anatomical sense—though this cannot be excluded—but as indicating that the results of puerperal sepsis to be discussed are those which may be found a period of time well after that which is commonly regarded as constituting the puerperium.

Trauma in the Problem of Puerperal Morbidity

Concerning the scope of the discussion, we cannot, I think, rule out the consideration of sepsis which is autogenous in origin, and still less can we, if our consideration of the subject is to be of service, rule out the question of trauma, which in so many cases must have provided the avenue for infection. The latter must be our central theme to the extent of excluding from our discussion the class of case in which the trauma, *quâ* trauma, is the cause of the dominant signs and symptoms that accompany the morbidity. Strictly speaking, and apart from the separation of the secundines, there is no labour which is wholly free from some degree of trauma in the birth canal—in *all* cases at the cervix level and in all primiparae also at the ostium vaginae. It is a significant reflection, too, that in this sense there is in every case a gateway, small though it may be, for unresisted infection.

If we could really understand why it is that in the majority of cases infection does *not* occur—in other words, if we knew more fully what are the factors and conditions which constitute resistance to infection—we should be in an infinitely happier position, and we should probably have little use for subterfuge in the "irreducible minimum." If we understood one normal, and therefore uninfected, case through and through, then, like Tennyson's "flower in the crannied wall," it would bring to us a whole world of meaning.

Combined Traumatic and Infective Lesions in Maternal Morbidity

If it be true, and I believe it *is* true, that it is not possible to express in other than speculative figures the general prevalence of late puerperal morbidity, our task is the more difficult if we try to isolate from the component factors of the whole problem of morbidity the prevalence of that one which, by common consent, is much the largest—namely, sepsis. Its position in mortality rates is notorious. The Health Organization of the League of Nations gives it in world rates as responsible for 50 to 75 per cent. of maternal deaths. We may be well assured it holds a highly responsible status also in respect of puerperal morbidity.

Combined traumatic and infective lesions accounted for 48 per cent. of all the gynaecological operations in a given year at the Royal Samaritan Hospital, Glasgow, and 47.3 per cent. was the corresponding figure, over a period of six years, at the Royal Infirmary, Liverpool. Blair-Bell, in the Ingleby Lectures, 1931, expressed the view that in England and Wales trauma and infection accounted for 75 per cent. of all maternal disablement, and that from all causes 60,000 (10 per cent.) parous women were crippled annually, many gravely; others, though less seriously injured, were yet sufficiently so to cause ill-health and disablement. James Young more conservatively estimates the annual disablement toll as 40,000. In the absence of any generally adopted scheme for the record and follow-up of cases there must always be widely varying estimates of their numbers and nature.

An Investigation in the Literature

Munro Kerr, in *Maternal Mortality and Morbidity* (1933), commenting on the inadequacy of the information to be obtained from mere pyrexial records covering shorter or longer periods of post-partum time, makes a plea for the fuller and more significant facts to be derived from an extensive investigation of the histories of mothers who have completed their child-bearing, together with an investigation of deaths due to child-bearing but occurring at long intervals thereafter.

Many women, as a result of infection, cease to bear children long before the advent of the climacteric, and the retrospect of the reproductive life of a number of mothers, a sufficiently large number to warrant average deductions, must be profoundly impressive in regard to the scope of the resultant familial and communal disabilities.

Munro Kerr includes in his book an able and reliable contribution by Dr. Donald McIntyre, which embodies an

* Read in opening a discussion in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Melbourne, 1935.

Table showing Importance of Infective Lesions of the Reproductive Tract resulting from Child-bearing in 2,700 cases in Dr. Donald McIntyre's wards in Royal Samaritan Hospital, Glasgow (1928–32).

Lesions or Groups	Total Cases	Average Age	Parous	Average Parity		Instrumental Deliveries		Interval since last pregnancy, in years.
				Children	Abortions	Patients	Total	
1. Chronic endocervitis with or without cervical erosion, and with or without corporeal endometritis	152	30.5	109	2.35		41	60	—
2. Chronic corporeal endometritis	103	32.0	74	4.2		25	—	—
3. Chronic subinvolution and chronic metritis	146	39.5	146	4.2	0.64	70	115*	7.7
4. Inflammatory hypertrophy of cervix	57	37.2	57	4.2	0.55	38	60	5.5
5. Inflammatory lesions of tubes and ovaries	59	34.0	59	2.3	0.63	24	27	5.6
6. Pelvic peritonitis and cellulitis	16	30.6	15	2.3	0.6	5	8	6.6

* Two had Caesarean section performed.

investigation of disablement resulting from infection and trauma in childbirth, and gives a table (here reproduced) showing the importance of infective lesions on the reproductive tract resulting from child-bearing in 2,700 cases in Dr. McIntyre's wards in the Royal Samaritan Hospital, Glasgow (1928–32). With regard to the analysis of chronic infective lesions, McIntyre refers to the well-known difficulty in connexion with the identification of the type of the infecting organism, especially in the lower part of the genital tract, and as regards the upper levels of the tract he alludes to the fact that in the majority of instances pus or inflammatory exudate, if present, is sterile.

CHRONIC ENDOCERVICITIS

Commenting on the cases in the various groups of the table Dr. McIntyre says concerning Group I that eleven cases were probably instances of puerperal infective lesions located in the pelvis, leaving chronic conditions of a disabling nature. This group of conditions of the cervix, the sequelae as they so often are of puerperal sepsis with or without trauma, is regarded, with good cause, as predisposing to carcinoma, and is therefore of cardinal importance.

This causal relation is discussed in an interesting and able fashion by Professor G. I. Strachan in a paper on "Some Aspects of Cervical Pathology," contributed to the *British Journal of Obstetrics and Gynaecology* (1933, xl, No. 3). He refers to the inevitability of some degree of trauma in labour, and says that chronic inflammatory and irritative after-effects may be as marked after slight as after marked laceration of the cervix ; and that these after-effects and the symptoms produced by them and their late sequelae depend much more on the degree of infection contracted in the puerperium than on the physical extent of the laceration.

The majority of cervical lacerations, being of minor dimensions, are with difficulty recognizable, if at all, under the conditions prevailing at or shortly after labour, and are therefore not amenable to the sutural treatment which is so clearly indicated for the injuries of greater extent. Given infection, therefore, the possibilities of the development of the results—it may be at a remote period—of chronic irritation of the cervical tissues represent a wide field.

The quality of persistence, almost unequalled in other organs of the body, that characterizes infection of the cervix is well calculated to reinforce the other influences present which favour disorder and degeneration of its tissues. In this connexion Strachan quotes the commonly accepted view that the term "erosion" is unwarranted, that the condition is not a chronic ulcer, but that it represents an extrusion of columnar gland-bearing epithelium on to the vaginal portion of the cervix. He claims, however, that, microscopically, inflammatory changes, as evidenced by round-celled infiltration, especially under the surface and around the glands, are well seen, and that the impression is conveyed of a chronic infection constantly repeated. He explains that in a large proportion of such cases there is no junction between the columnar and the squamous epithelium ; that microscopically a raw and often small area of granulation tissue devoid of any epithelial covering usually persists between the two epithelia ; and that it is in such cases that the signs of chronic infection continue. Such a condition may persist for years.

Cervical infection is favourably affected by the menopause, and the physiological post-menopausal atrophy of the cervix may be strikingly illustrated by the reduction of a hypertrophied, chronically infected cervix to the dimensions of a small nodule in the vaginal vault, owing to the disappearance of the fibro-muscular tissue, mainly, it is thought, from diminished blood supply. The epithelial elements, however, may persist in good condition in the cervix long after the menopause, thus affording a contrast to the post-menopausal changes in the body of the uterus, where the atrophy of the epithelium and the persistence of the fibro-muscular walls are the normal events.

With regard to the age incidence of carcinoma of the cervix, Strachan finds that in 300 cases 54 per cent. occurred in the post-menopausal period, while 49 per cent. occurred at or over 50 years of age ; he quotes percentage figures given by Wilson, Roger Williams, and Weibel as pointing to the same conclusions.

The view is supported that, the irritation of the chronic infection of the cervix notwithstanding, the fibro-muscular tissue with its good blood supply usually prevents the development of carcinoma in the epithelial elements, but that after the menopause, the resistance of the fibro-muscular tissue being lowered, the well-formed epithelial elements are more liable to take on unrestricted growth and penetrative powers, with the production of carcinoma in either the squamous or the columnar epithelium.

CHRONIC CORPOREAL ENDOMETRITIS

In 11.6 per cent. of Dr. McIntyre's 103 cases in which the diagnosis of chronic corporeal endometritis was established histologically, a history was obtained which would justify the assumption that the condition originated in puerperal infection. The history also revealed that, as compared with the chronic endocervicitis group in which the fertility rate was definitely depreciated, the average parity in corporeal endometritis (diagnosed histologically) was equal to the communal rate.

CHRONIC SUBINVOLUTION AND CHRONIC METRITIS

Commenting on this group of conditions Dr. McIntyre says that a definite origin in puerperal infection is not easily established, in view of the causal infection being so frequently one of low virulence. In 10 per cent., however, a puerperal infection origin is traceable, but

in nearly 50 per cent. there was a history of artificial aid to delivery.

INFLAMMATORY HYPERTROPHY OF CERVIX

Cases were not included in this group in which injury to the cervix was recognizable, as the trauma in that event was regarded as primary and the infection as secondarily imposed. Under these conditions, therefore, only four of the fifty-seven cases in this group would qualify strictly as primarily due to sepsis. The majority would represent the common history of trauma of the cervix during delivery, followed by a greater or less degree of ectropion involving eversion of the canal with exposure of its columnar epithelium, infection, and possibly repeated reinfection.

INFLAMMATORY LESIONS OF TUBES AND OVARIES

In the fifty-nine cases under this heading there was a clear or a presumptive history of puerperal fever in twenty-one. In thirty-seven no pus was found at operation, and of the remaining operation cases in which pus was found in *five only* were the organisms identified.

As is well known, pus, where present in these cases, is frequently sterile. Its fluid content may become absorbed and leave an inspissated material, which in due course may disappear together with the surrounding inflammatory exudate. The prolonged later phases are afebrile, and are often accompanied by poor general health and few, if any, local signs and symptoms. The passive treatment and observation implied require patience on the part of doctor and patient, but the result is well worth waiting and catering for. It is the basis of the "ambulatory treatment" of which Arthur Curtis has written so convincingly.

In the retrospect of our cases coming into the category we are now considering most of us, I think, are gratified to note that the proportion of instances in which we do *not* perform laparotomy is increasing. In Dr. McIntyre's table, out of the fifty-nine cases in this group laparotomy was not performed in ten.

Tuberculous infection was, as far as possible, excluded, and, with this exclusion, the parity rate was low. In comparison with viable births the abortion rate was high, and was associated with a high incidence of septic infection.

In dealing with the point that cases of gonococcal infection may have been included, Dr. McIntyre admits the difficulty of disproving the suggestion, but claims that in the experience of himself and his colleagues it is a comparatively rare infection in the upper levels of the genital tract, and that of the five cases in which organisms were isolated from the pus present, in not one was the gonococcus found.

PELVIC CELLULITIS AND PELVIC PERITONITIS

In five cases of the sixteen in this group there was a probability of puerperal infection being the causal agent. In this, as in the preceding group, the parity rate was low and the average age of the patient young. For anatomical reasons the association between the two groups must be close.

URINARY INFECTION

Under this heading reference is made to three cases in which bladder infection was certainly the important, and probably the only, puerperal complication present. It is added that these cases are noted to indicate the fact that the category of disabilities which may result from child-bearing must include urinary tract infection, and, further, to illustrate the difficulty in tracing infective lesions in the pelvis to the puerperal state from *histories*, the facts of which are dependent on the memory and intelligence of the patients.

To this valuable contribution on disablement resulting from infection in childbirth a summarizing note is appended indicating that chronic infective lesions, when restricted to the lower level of the genital tract, produce discharge, discomfort, mild invalidism, and possibly sterility; that treatment is possible without serious tissue destruction; that at the higher levels of the reproductive tract invalidism is pronounced, and destruction of tissue may lead to arrest, premature termination of reproductive life, or total loss of the essential reproductive organs; and that there is but one bright aspect of this matter—namely, when operative treatment is carried out the mortality is very low.

The capacity of resistance to reinfection, it is reasonable to assume, is one of the factors involved in the absence of mortality following the operations indicated in the table we have been considering. This, or certainly a very low mortality rate, is a common experience among us as operators, and tends to support the view held by some that non-fatal puerperal infection may confer a measure of immunity against subsequent similar infections.

Thrombophlebitis

Thrombophlebitis following puerperal infection must certainly be added to the list of conditions in our category. The risk of embolism in point of time may not, in fact, be remote, but the dread of it, by both practitioner and patient, may be unduly prolonged. I recall an illustrative case. The patient was a nurse, who therefore knew much and yet too little about embolism. She had been bedridden for many months, and long after every vestige of swelling had disappeared was still terrified of the possibility of embolism being induced by any considerable movement or by getting up. She was persuaded to put away her fears, and speedily resumed a normal existence.

Apart from embolism, phlegmasia of one or both limbs may result in prolonged disablement. In hospital clinics the follow-up treatment is usually continued in the physiotherapeutic department.

It will be understood that, with certain allowances, the conditions dealt with in the foregoing may equally well be sequent to abortion or premature labour as to labour at term.

I have not made special reference to possible effects of puerperal infection on other pelvic conditions such as uterine fibroids, ovarian tumours, and the like, as these effects are usually too immediate for our title; and the same observation will probably apply to the protean developments of pyaemia and to puerperal insanity with the psychoses in so far as they may be related to infection.

By its very size detailed *Treatment* is excluded from this paper and *Prevention* is summed up in the New Dispensation of ante-natal, intra-natal, and post-natal care.

C. J. Roos (*Nederl. Tijdschr. v. Geneesk.*, July 13th, 1935) records an outbreak of thirty-three cases of an acute exanthem which occurred at Rotterdam at the end of 1934. With the exception of a man aged 20, all the patients were children aged from 2 to 13 living in two adjacent streets, and a large number of them were attending the same school. The rash, which appeared with only a slight prodromal headache and feverishness, showed the typical appearances of erythema infectiosum. On the other hand, the peripheral lymphatic glands, including the cervical chain, which are not usually affected in erythema infectiosum, were enlarged as in rubella, and examination of the blood showed the picture characteristic of that disease—namely, relative lymphocytosis and a plasmocytosis, the proportion of plasma cells varying from a minimum of 1 to a maximum of 11.5 per cent.

THE TREATMENT OF TUBERCULOUS EMPYEMA *

BY

M. P. SUSMAN, M.B., Ch.M., F.R.C.S.

HONORARY ASSISTANT SURGEON, SYDNEY HOSPITAL, AND HONORARY THORACIC SURGEON, MATER MISERICORDIAE HOSPITAL, SYDNEY

In discussing the treatment of any particular tuberculous lesion it is necessary to stress a commonplace—namely, that we are dealing with a tuberculous patient and not just a local focus ; constitutional treatment is therefore essential throughout, and this includes all those dietetic, hygienic, and medicinal measures that have stood the test of time.

A second point to remember is that, although a certain amount of standardization is necessary and desirable, each patient should receive individual treatment. This is attained by correlating and adapting the principles of treatment discussed below to the special features peculiar to every patient.

Methods and Principles of Treatment

Minor surgical procedures are usually done by a physician. They comprise: (1) aspiration alone, or with air replacement and/or irrigation ; and (2) oleothorax. Major surgical operations consist of: (1) intercostal drainage, open or closed ; (2) thoracotomy and drainage, open or closed ; (3) phrenic avulsion, either alone, or to supplement thoracoplasty or pneumothorax or oleothorax ; (4) thoracoplasty, partial or complete ; and (5) rib resection and excision of granulation tissue and thickened pleura forming the outer wall of the cavity, or the fashioning of a hinged flap from this tissue, which is then brought into close contact with the visceral pleura.

The principles of treatment may be divided into general (in addition to constitutional treatment) and particular. Under the former heading comes: (1) the avoidance of secondary infection, or, if it occurs, its prompt and adequate treatment to minimize constitutional and local damage ; and (2) the relief of symptoms, especially those due to mechanical causes, such as a large collection of fluid or a valvular pneumothorax. In the group labelled "particular" two possibilities have to be considered: (1) if the underlying lung is apparently healthy we aim to obliterate the empyema cavity by getting the lung to expand ; (2) if the lung is diseased, and especially if there is cavitation, we must treat the pulmonary lesion as well as the empyema, so that we aim to keep the lung collapsed.

Choice of Treatment

It is clear that the main factors that determine the treatment to be adopted are: (*a*) the state of the lung or lungs ; (*b*) the presence or absence of pyogenic infection. Subsidiary factors include: the age and general condition of the patient, the age of the empyema, the presence of bronchial or cutaneous fistula, the presence of tuberculosis elsewhere, and the severity of the infection and the response to preliminary treatment.

Since the condition of the lung and secondary infection are the most important modifying factors, it is convenient to describe the details of treatment under the following four headings:

(A) There are no signs of pulmonary tuberculosis and there are no pyogenic organisms in the empyema.

(B) Pulmonary tuberculosis is known to be present, but there are no pyogenic organisms in the empyema.

(C) There are no signs of pulmonary tuberculosis, but pyogenic organisms are present in the empyema.

(D) Pulmonary tuberculosis is known to be present, and pyogenic organisms are present in the empyema.

There are several points to make about these groups. Though we say that there is no evidence of pulmonary tuberculosis in Groups A and C, many of these patients do have a lung lesion, even if it only a small one. The number of patients in Groups A and C is very much less than the number in Groups B and D. The absence of pyogenic organisms on one or two examinations of the pleural fluid is not enough to exclude secondary infection ; repeated smears and cultures must be made when there is doubt. At the same time the patient should not, as a rule, be treated as though he had a secondary infection until the pyogenic germs are found. The absolute diagnosis of tuberculous empyema depends on the finding of the specific bacillus or on a positive animal inoculation ; less certain criteria are the microscopical appearances of a piece of the pleura or the wall of a sinus, the seeing of tubercles through a thoracoscope, and an excess of lymphocytes in the pleural fluid. All these tests may be negative on one or two occasions, so that many examinations may be necessary. Finally, a tuberculous empyema often begins as a serous effusion in one of several ways. It may complicate: (1) an artificial pneumothorax, (2) a spontaneous pneumothorax, (3) pulmonary tuberculosis without any obvious cause ; (4) it may be due to rupture or puncture of a subpleural focus, or to rupture or division of pleural adhesions ; (5) it may arise apparently *de novo*, without any obvious tuberculosis of the lung (Groups A and C). This, I repeat, is rare, although pleurisy with serous effusion that does not become an empyema is common enough.

Treatment of Group A

(NO KNOWN LUNG LESION AND NO PYOGENIC INFECTION)

Our object is to free the pleural cavity of pus and to secure obliteration of the cavity by getting the lung to expand. Aspiration alone may suffice, but it is usually necessary to supplement this by air replacement in decreasing amounts, thus allowing the lung to creep out, an injection of 5 c.cm. of methylene-blue (2 per cent.) being made to sterilize the effusion and act as pleural lavage. Alternatively, the lung may expand to a certain limit and stop: a local thoracoplasty over the residual cavity may be enough to obliterate it. Should the lung fail to expand at all, and fluid persistently re-form after aspirations, a complete thoracoplasty in two or more stages is required. Between the stages any pus should be aspirated, otherwise it may rupture into a bronchus or cause pressure symptoms as well as prevent the two pleural surfaces from adhering. The great thing is to get the thoracoplasty done before secondary infection occurs.

Finally, if the empyema is an old one, and the outer wall is a thick layer of organizing granulation tissue, it may be necessary to excise this wall or make a flap from it.

Treatment of Group B

(LUNG LESION PRESENT BUT NO PYOGENIC INFECTION)

Here our aim is to cure the empyema and at the same time to treat the underlying lung disease by keeping the lung collapsed. Instead of putting in decreasing amounts of air, as in Group A, we put in amounts sufficient to keep the lung down. If the lung tends to expand in spite of the air refills, or effusion persistently recurs, oleothorax should be tried. If the latter fails we do a thoracoplasty with phrenic avulsion. If thoracoplasty is contraindicated by the patient's general condition or by disease in the opposite lung, intercostal drainage and

* Read in opening a discussion in the Section of Public Medicine at the Annual Meeting of the British Medical Association, Melbourne, 1935.

lavage may tide him over until he is fit for thoracoplasty; if he does not improve enough, the drainage must be permanent.

An exception to these rules must, however, be noted. If the tuberculous empyema follows artificial pneumothorax late in the course of the treatment, the lung may have recovered so much that we may safely allow it to expand, as in Group A.

Treatment of Group C

(NO KNOWN LUNG LESION, BUT PYOGENIC INFECTION PRESENT)

Our objective is the same as in Group A, but often the secondary infection is too severe for the simpler methods of treatment. If the patient's condition is good and the infection is mild, aspiration, air replacement, and irrigation may lead to cure. Usually the above treatment only brings improvement, and then we should institute closed intercostal drainage plus irrigation if there is no bronchial fistula. Oleothorax may be tried before drainage, but the results are variable; it may succeed in closing a small bronchial fistula. Where there is a large bronchial fistula rib resection and open drainage is the best treatment. Very rarely the fistula closes and the lung re-expands. Most of these patients need a complete thoracoplasty, with or without excision of the outer wall of the cavity, or conversion of it into a flap. Neither cutaneous fistula nor bronchial fistula is a contraindication; both may, in fact, be cured by the operation. The severity of the secondary infection must be first reduced as far as possible by frequent irrigations, etc., before doing the thoracoplasty.

Treatment of Group D

(LUNG LESION AND PYOGENIC INFECTION BOTH PRESENT)

The patients of this group have the worst prognosis of all. The survivors, with few or no exceptions, will require a total thoracoplasty. The preliminary treatment is much the same as in Group C, but once the secondary infection is under control the thoracoplasty should be done as soon as possible, lest the lung should start to expand. If the patient remains too ill for thoracoplasty, permanent drainage and irrigation is all that is left to do.

Aspiration and Air Replacement

This can be done through one needle with two taps, or through two needles—one for the withdrawal of the fluid and the other for the running in of the air or gas.

Pleural Lavage

This can be done through one needle only if the cavity is small; some of the effusion is first withdrawn, and then a lesser amount of the irrigating fluid is run in. The process is repeated until the cavity is practically empty. If the cavity is large two needles should be used and, after aspirating, the cavity should be filled with the irrigating fluid from below upwards and this repeated until the return flow is clear. If lavage is successful the effusion becomes thinner and less infective, and gradually disappears.

Various fluids have been recommended for irrigations: (1) Dakin's solution is particularly useful when the pleura is thickened and there is severe secondary infection; (2) ordinary salt solution is used when the pleura is relatively thin, and especially if there is a bronchial fistula and irrigation is still wanted; (3) dyes sometimes seem to do good—for example, 0.1 per cent. gentian-violet, or 0.2 per cent. methylene-blue, or 2 per cent. cresyl-violet.

After the irrigation a small amount of a stronger concentration may be instilled and left in—for example, 20 c.cm. of 1 per cent. gentian violet, or 20 c.cm. of 2 per cent. methylene-blue in absolute alcohol if tubercle bacilli are found in the effusion; this should not be repeated more than once, as it sometimes causes a bloody exudation.

If the effusion is too thick to aspirate it may be made more fluid by means of certain *modifying agents*. There are three of these. (1) Gauvain's solution: guaiacol 2 parts, creosote 2 parts, iodoform 5 parts, ether 10 parts, and olive oil 100 parts. Twenty c.cm. are injected and left for twenty-four hours. The procedure is repeated, if necessary, until aspiration becomes possible. Oxygen or air replacement makes it easier. (2) Chlorazone or chloramine-T: 30 to 50 c.cm. of a 0.5 per cent. solution is left in for twelve to eighteen hours and then aspirated with the effusion. (3) Pepsin solution. This consists of pepsin 20 parts, carbolic acid 2 parts, hydrochloric acid 2 parts, and distilled water to 400 parts; 50 to 100 c.cm. are left in for six to twelve hours.

Oleothorax

The chief indications for oleothorax are: (1) recurrent purulent effusion when the lung is diseased and our aim is to keep it collapsed, or if the lung tends to expand in spite of air refills; (2) as a preliminary to drainage of a secondary infected empyema; (3) a small bronchial fistula; (4) severe toxaemia, whether from a pure tuberculous or from a mixed infection.

For these indications we use 5 per cent. gomenol in olive oil. An initial testing dose of 5 c.cm. only is given, and if there is no reaction several hundred cubic centimetres may be injected. Even if it fails to cure, it often makes the subsequent thoracoplasty safer. But it can be dangerous. It may make the lung condition worse, or it may cause a large pleural effusion, and although it may cure a bronchial fistula it may cause one if the empyema walls are stiff and the intrapleural pressure rises so much that the oil bursts through the lung.

Intercostal Drainage

The main use of drainage is to get the patient into better condition for more radical treatment. The chief indications are: secondary infection not controlled by aspiration, lavage, and air replacement; a bronchial fistula that does not close soon, especially if oleothorax has been tried; and rapid recurrence of effusion in spite of treatment by aspiration, etc. As a rule it is best to avoid drainage when there is still no secondary infection, but where the patient is under strict supervision and the empyema is of long standing, air-tight intercostal drainage may cure it when other means have failed. With proper care the drainage may be maintained for months without secondary infection occurring, and it may make an ill patient well enough for a thoracoplasty if it is required.

Rib Resection and Drainage

This is required when the more conservative measures have failed. The resection should be done in front of the anterior axillary line in order that there will be the clean operation field for the thoracoplasty that most of these patients will need.

Phrenic Paralysis

The chief use of phrenic paralysis in tuberculous empyema is to supplement other measures such as thoracoplasty or oleothorax. As it reduces the size of the hemithorax it may be beneficial in all groups of empyema. A persistent cutaneous sinus near the diaphragm may close after phrenic avulsion when other measures, such as cauterization, have failed. It also relieves symptoms

due to involvement of the nerve and diaphragm in the inflammatory reaction, such as paroxysmal cough and pain.

Thoracoplasty

This is especially indicated when, first, the lung is diseased, particularly if there is cavitation or much fibrosis; and, secondly, when the empyema cavity persists in spite of less radical treatment.

As the chest wall is rigid and thickened as the result of the empyema, it is necessary to remove large sections of the ribs in order to get the two visceral surfaces into contact, for the adhesion of these two layers is the essence of the operation. The operation consists of removal of the whole of the first rib, most of the second and third, and half to three-quarters of the fourth to the tenth ribs. It is done in two or more stages, with intervals of fourteen days or longer, according to the patient's condition. Between stages, and after the operation is completed, it is important to remove any effusion. To assist the falling in of the chest wall we try to delay the regeneration of the ribs by painting the rib beds with 10 per cent. formalin or with Zenker's fluid (potassium chromate 2.5 parts, sodium sulphate 1 part, corrosive sublimate 5 parts, glacial acetic acid 5 parts, and water 100 parts). The operation is begun from above and is usually supplemented by a phrenic avulsion. If the cavity is very large and the chest wall unusually thickened, the transverse processes may be removed with the corresponding ribs. After the operation the patient must wear a special thoracoplasty belt to maintain compression of the diseased side.

Other Plastic Operations

1. Where there is a large cavity or much calcification of the wall a preliminary modified pneumolysis may prove useful. One rib only is resected and the rest are stripped but left in place; the space between the ribs on one side and the intercostal structures and the periosteum on the other is packed with gauze, thus pushing the soft parts of the chest wall towards the mid-line, and the superficial tissues are sutured over the gauze pack. This is removed in ten days, and the wound is closed without drainage.

2. If the lung is completely collapsed and the walls of the cavity are very thick and there is a fistula, still more radical operation may be called for, such as complete decostalization, with removal of parietal pleura, intercostal tissues, and periosteum, and cauterization of the bronchial fistula. Decortication of the visceral pleura is contraindicated in tuberculous empyema.

3. Instead of excising the outer wall of the pleural cavity after the rib resections, the surgeon may make a flap from it so that it can be swung on to the visceral wall and kept in close contact by a pack, over which the superficial tissues are sewn. The pack is removed in ten days. This operation has the same rationale as (1) above, and is more likely to be successful.

Results of Treatment

The mortality of tuberculous empyema is between 30 and 50 per cent. The chief causes of death are secondary infection and tuberculosis of the lungs; less common causes are tuberculous meningitis and generalized tuberculosis. The main operative risks, apart from shock, haemorrhage, etc., are aspiration bronchopneumonia and other chest complications. J. Alexander, in a series of seventy patients, of whom sixty-nine had secondary infection and/or disease in the corresponding lung, found that 61.4 per cent. were cured—that is, the empyema cavity was obliterated and there were no tubercle bacilli in the sputum, or there was no sputum at all. Deaths accounted for 32.9 per cent., mainly from advance of the pulmonary disease, and spread to the opposite lung. In forty-five of the seventy cases thoracoplasty was done, and 80 per cent. of this group were cured. Brian Taylor, at the Brompton Hospital, studied a series of seventy-nine patients with tuberculous empyema. Twenty-five were alive at the end of five years (31.6 per cent.), forty-six were dead (58.2 per cent.), and the rest were untraced. Thirteen had thoracoplasty and four were dead at the end of the five-year period, a mortality of 30.8 per cent.

Illustrative Case Records

I have not yet seen a patient belonging to Group A—that is, with tuberculous empyema without secondary infection and without disease of the corresponding lung. As an example of Group B—pulmonary tuberculosis is known to be present and the empyema is not secondarily infected:

W. B., a male aged 19, was considered to be suitable for thoracoplasty for simple tuberculous empyema and tuberculosis of the underlying lung. Unfortunately the opposite lung was also diseased, and the patient's condition after the first stage became so bad that the rest of the operation had to be postponed indefinitely. Aspiration and lavage are being done in the meantime in the hope that the patient will improve sufficiently to stand the completion of the operation.

As an example of Group C—mixed tuberculous empyema without gross evidence of pulmonary tuberculosis:

E. B., a lad aged 19, was admitted to hospital with a left pleural effusion apparently secondary to a recent acute influenza or pneumonia. Although the organisms found in it resembled pneumococci, the fluid was thin and turbid, and suggestive of a streptococcal infection. Aspiration was ordered as a preliminary to thoracotomy, in accordance with the well-known procedure for streptococcal empyema. Further bacteriological examinations of the aspirated fluid revealed tubercle bacilli. Aspiration and lavage resulted in apparent cure, and the patient was sent to a sanatorium for further observation.

As an example of Group D—pulmonary tuberculosis is known to be present and the empyema is secondarily infected:

J. B., a male aged 20, had a spontaneous pneumothorax which resulted in an infected tuberculous empyema. Tubercle bacilli were found in the sputum, and the other lung was seriously affected. The empyema was drained through an intercostal tube by siphonage and suction. The patient was desperately ill, but gradually improved, and in the end he survived a total thoracoplasty done in three stages, supplemented by phrenic paralysis.

I am indebted to Brompton Hospital for opportunities to study this malady, and other chest diseases, during my term as surgical clinical assistant last year, and especially to Mr. Tudor Edwards, under whom I worked, for counsel and instruction on all occasions, and for the case records quoted. I am also grateful to the other surgeons of Brompton Hospital and to Mr. Morriston Davies, all of whom generously gave me of their knowledge and experience.

It has been decided to hold at Royat every third or fourth year an international conference on some physiological, pathological, or therapeutic aspect of cardiovascular disease. The first of these conferences will be held during Whitsuntide, 1936, when the lecturers will be: Professors Heymans and Brouha, on vascular tonus; Professor Riser, on vascular spasm in the brain; Professors Leriche and Fontaine, on vascular spasms in the limbs; Professor Marañon, on vascular spasms associated with endocrine disturbances; and Professor Loeper, on the therapeutics of vascular spasms. The papers will appear afterwards in book form.

OBSERVATIONS ON INFECTION BY PLASMODIUM KNOWLESI (APE MALARIA) IN THE TREATMENT OF GENERAL PARALYSIS OF THE INSANE

BY

C. E. VAN ROOYEN, M.D.Ed.

HALLEY STEWART RESEARCH FELLOW, AND LECTURER IN BACTERIOLOGY, UNIVERSITY OF EDINBURGH

AND

G. R. PILE, M.B., Ch.B.Ed.

SENIOR ASSISTANT MEDICAL OFFICER, MIDLOTHIAN AND PEEBLES ASYLUM, ROSSLYNLEE

(From the Midlothian and Peebles Asylum, Rosslynlee, and the Department of Bacteriology, University of Edinburgh)

This investigation was directed towards overcoming certain well-known difficulties associated with the induction of benign tertian malaria for the treatment of general paralysis of the insane. The principal disadvantages of the existing method may be summarized as follows. The average clinician resident in cool climates is frequently unable to obtain a specimen of infected blood at very short notice, and much valuable time may thereby be lost in commencing the treatment of an early case. Yet again, when blood has been obtained there is a temptation to seize the opportunity of treating several other cases resident in the district by the transference of blood from one patient to another, a procedure which is only to be condemned. Apart from the fact that the practice of this method is liable to transmit other coexisting infections, successive passage of the parasites from one individual to another results in progressive attenuation of their virulence. Thus each subsequent patient treated has milder febrile reactions, and accordingly derives less and less benefit from this mode of therapy.

From the purely theoretical standpoint the ideal method of infecting each patient is by subjecting him to the bite of an infected *Anopheles* mosquito. Alternatively, he can be injected with blood from a case of naturally acquired malaria with a negative Wassermann reaction, both of which requirements offer a formidable obstacle to many clinicians. These two methods do, nevertheless, offer the only available means whereby malaria therapy could be instituted in disseminated sclerosis and other conditions in which the introduction of Wassermann positive sera is deemed undesirable.

In view of these considerations we have employed in the treatment of general paralysis of the insane the naturally occurring ape malaria parasite *Plasmodium knowlesi* (Sinton and Mulligan, 1932), which we have successfully transmitted to twelve human subjects. The pathogenicity of *P. knowlesi* to man has already been demonstrated by Knowles and Gupta (1932), who infected three human volunteers in India. We have investigated the practical applicability of substituting this type of parasite for *Plasmodium vivax* in the treatment of G.P.I., and the following cases illustrate the application of this form of infection in the treatment of the disease. Clinical notes concerning the course of ape malaria occurring in man, the action of certain antimalarial remedies on this type of infection, and various experimental data are also incorporated.

The work has been carried out with a strain of parasite originally obtained from the Malaria Survey of India, and which was supplied to us by the courtesy of Sir Rickard Christophers of London, to whom we owe our thanks.

Case I

History.—The patient was a male aged 63, a coal miner. He had been physically a powerful man, whose strength had been ruined by excess. He was a noted alcoholic in his district, consuming a bottle of whisky daily during the week-ends, and had done so for years. He had become excited, very noisy, and confused, with grandiose delusions which led him to be exceedingly stubborn and resistant to any treatment. For the last twelve months he had been under the care of his own doctor as a cardiac case.

Examination.—This showed a well-built individual, with the skin clean and clear, and with marked arteriosclerosis of radial and ulnar arteries. The cardiac sounds were feeble, and there was a blowing first sound propagated into the axilla, with distinct accentuation of the second sound. The pulse was 71 and irregular in time and force. Signs of chronic bronchitis were present. As regards the alimentary system there was nothing of note, except that the patient had a very poor appetite, and had a right-sided inguinal hernia, which was reducible. Examination of the nervous system gave the following data. Ankle- and knee-jerks exaggerated; wrist and elbow reflex strongly positive; plantar responses normal; abdominal reflex negative. There was irregularity of the pupils, and the Argyll Robertson sign was positive. Coarse tremor of the tongue and slurred speech were noticeable. The Wassermann reaction was negative. The specific gravity of the urine was 1024, with no abnormal constituents.

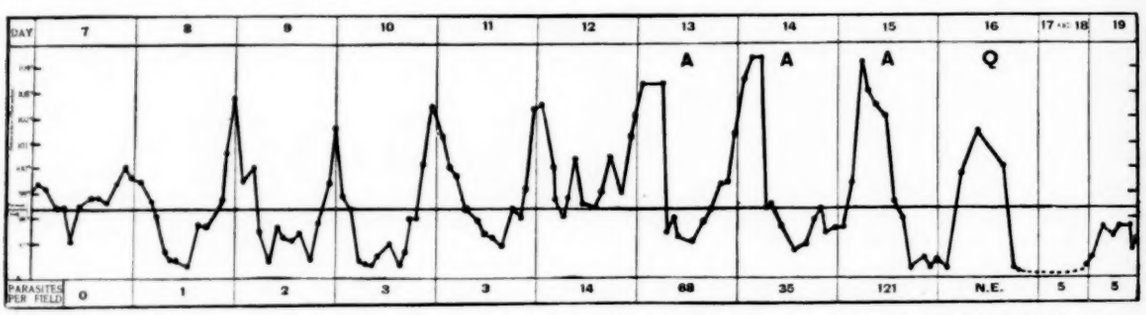


Chart 1.—A two-hourly temperature chart of Case I, showing pyrexia of quotidian type. Inoculation with 3 c.cm. infected blood was made six days before the chart begins. Antimalarial treatment commenced at day 13. A = atebrin given. Q = quinine started. N.E. = no examination for parasites.

Treatment.—Accordingly 3 c.cm. of infected monkey blood was injected intramuscularly into the deltoid muscle on April 23rd, and two-hourly charting of temperature, pulse, and respirations was instituted. From the time of inoculation there was a sharp fall in temperature to an average of 97° F., with a rise to normal on the second day after injection. At this time blood films were made and examined, but proved to be negative.

Progress.—Seventh day: On the morning of this day at 2 o'clock the temperature had risen to 99.4°, but had fallen to normal by 6 a.m. There was no marked constitutional upset, and no sweating with the fall in temperature. By 10 p.m., however, the temperature had risen to 100°, when the patient was flushed and considerably excited. By midnight the temperature had dropped four points. *Eighth day:* Pyrexia progressively fell to 96° by 2 p.m., and this was

followed by a sharp rise to 98° at 4 p.m., and a further rise to 102.6° at midnight. The patient was somewhat distressed, and was very confused and excited. *Ninth day:* He was vigorously sponged, and by 2 a.m. the temperature had fallen to 99.6°, to be followed by a slight rise to 100° at 4 a.m., and a further fall to 96.8° by 8 a.m. The patient was quiet at this time, cheerful, and quite comfortable. Urine examination revealed no abnormal constituents. At midnight, however, the temperature had again reached 101.4°, when he was very noisy and excited. *Tenth day:* Vigorous sponging again resulted in a fall to 98.8° by 2 a.m., which continued to fall to 96.6° by 6 a.m., and was accompanied by profuse sweating. At midnight another rise to 102.4° occurred, and was accompanied by the same increase in mental excitement and confusion. The patient was highly resistant to anything being done for him, but after sponging again the temperature fell to 100° by 4 a.m. *Eleventh day:* The temperature continued to fall, as during the previous twenty-four hours, and was accompanied by profuse sweating. It was 97° by 4 p.m. The patient was quiet and appeared exhausted. He was submissive to treatment and quite coherent in speech. Examination of the urine again revealed no abnormalities. At midnight the temperature rose to 102.2°, when the patient was almost uncontrollable, being very excited and restless, and striking out at those around him. *Twelfth day:* Instead of falling the temperature rose to 102.8° by 2 a.m., when the patient was cold-sponged, and had 10 grains of aspirin administered. The pulse at this time was 104, and very irregular in time and force. Following the administration of aspirin the temperature again fell to 98.4° by 6 a.m., and the patient appeared very tired, quite quiet, and coherent in speech. He was afebrile for the rest of the day. *Thirteenth day:* On this occasion the temperature rose to 103.4° at 2 a.m., and despite cold-sponging and 10 grains of aspirin this level was maintained for an interval of four hours until 6 a.m., when it fell sharply to 97.6° by 8 a.m., being again accompanied by profuse sweating. The patient, seen at 9 a.m., was very exhausted, and the pulse rate was 108 per minute and exceedingly irregular in time and force. There was also marked accentuation of the cardiac murmurs. Digitalis, 10 minims, was administered three-hourly from this time onwards.

Further Progress.—Having duly considered the patient's reaction to this form of therapy it was decided, in view of the cardiac condition, that it would be necessary to discontinue further rigors. An initial dose of 1½ grains of atebrin was therefore given at 2 p.m., which was followed by a further 1½ grains at 8 p.m. *Fourteenth day:* Despite atebrin the temperature rose to 104.4° at 4 a.m. and was maintained until 6 a.m. The patient appeared very weak and exhausted, having a feeble and irregular pulse rate of 80 per minute: strychnine hydrochloride (1/60 of a grain) was next injected hypodermically and brandy administered freely. *Fifteenth day:* Although atebrin had been given at 8 p.m. on the previous evening, at 6 a.m. the temperature suddenly rose to 104.2°, and thereafter fell rapidly to 96° during the ensuing twelve hours. During this period two further atebrin tablets were given orally, and two-hourly charting discontinued in order to give the patient more sleep. *Sixteenth day:* At 10 a.m. the temperature again showed a tendency to rise abruptly, and when it had recorded 101.2° quinine dihydrochloride (7½ grains) was injected intramuscularly into the gluteal region and a similar quantity of the sulphate was given orally. Subsequent to the administration of quinine there was a sharp fall to 96° at 5 p.m., and at 7 p.m. a collapse reading was recorded and 1/60 grain of strychnine was injected hypodermically. The collapse reading was recorded for the next forty-eight hours. From this time the temperature gradually returned to normal, the patient being dosed daily with 3 grains of atebrin and 1/2 grain of plasmoquine, while at the same time he was steadily digitalized. Two doses of quinine sulphate, 10 grains, were also given orally. There was a slight tendency to relapses on the twenty-third and twenty-sixth days, both of which were easily checked by plasmoquine.

Result.—The patient's recovery could only be described as remarkable, for within ten days from the cessation of treatment he was as fit as on admission, and careful physical examination revealed that he had not suffered any aggravation of the previous cardiac condition present, or involvement of any other system as a result of the treatment. At present he is eating heartily and reading the daily newspapers with interest. He can now for the first time since admission accurately recall past incidents which occurred twenty-six years ago, his speech is much clearer, and his grandiose delusions have disappeared. He is much more amenable to treatment, and only appears a little confused on waking from a heavy sleep. His son states that his mental and physical state appear to be better than they had been for the previous twelve months.

Case II

History.—This patient was under the care of Dr. Batchelor at the Royal Infirmary, Edinburgh. He was a man aged 53 years, who had contracted syphilis in 1919. From 1930 to 1933 he had complained of tingling and weakness of his left foot, which was followed in 1934 by loss of motor power in the left arm and same side of the face. These symptoms were accompanied by mental depression with insomnia, as well as by the presence of an ataxic gait. At this stage knee-, ankle-, and triceps-jerks were absent, the abdominal reflexes active, and there was some loss of tactile sense in the left hand and foot. Blood pressure was 100/60, and during 1934 he had received a further course of anti-syphilitic remedies.

Treatment and Progress.—This individual was inoculated intravenously on June 21st, 1935, with 3 c.cm. of infected monkey's blood. After an incubation period of six days his temperature rose sharply to 101° F., and thereafter rigors occurred at twenty-four-hour intervals with great regularity, and the temperature chart of this patient (see Chart 2) closely resembled that of Case I. Attacks generally developed in the evenings, and the highest temperature recorded

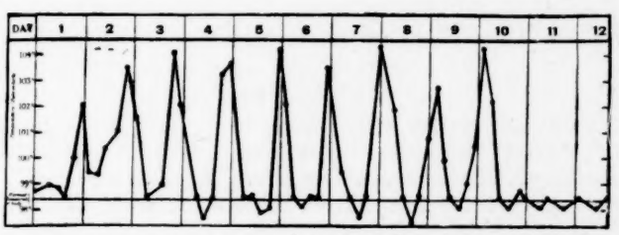


CHART 2.—Showing a four-hourly temperature chart of Case II. Inoculation took place six days before the chart begins. Day 1 is actually June 27th, 1935.

attained 104.4°. After nine rigors had taken place the number of parasites seen in the patient's blood was estimated to be 205 per microscopical field, and it was accordingly decided to terminate the infection. This was carried out by administering a preliminary intramuscular dose of 10 grains of quinine dihydrochloride, followed by 10 grains of the sulphate given three times a day orally. During the next three days parasites rapidly disappeared from the blood, and the infection was successfully exterminated.

Survey of Twelve Cases of Ape Malaria Infection in Man

Ten human individuals were successfully inoculated with *P. knowlesi*, and these cases will be referred to in the subsequent text as Cases III, IV, etc., up to XII. Although the course of the disease was found to be similar in these patients to that reported in Cases I and II, minor individual variations were met with. For example, the incubation period was found to be as short as three days in two instances and as long as fourteen days in two others, but in the majority of the patients the first rise of temperature occurred after the eighth day, and parasites appeared in the peripheral blood at about the tenth day.

Marked variability was also found to exist among the patients studied with regard to the degree of susceptibility to infection with this type of parasite. Thus, whereas the majority were readily infected with monkey's blood and

parasites progressively multiplied in their blood, a few were more resistant, for the infection failed to establish itself in these subjects. The latter feature was particularly noticeable in the case of three patients who had previously received a course of *P. vivax* (benign tertian) malaria therapy a year before, and in whom ape malaria could only be reproduced with difficulty.

Patients were inoculated intramuscularly as well as intravenously with 5 c.cm. of defibrinated monkey's blood obtained by cardiac puncture from an anaesthetized monkey. Both routes of inoculation effectively conveyed the infection, but the intravenous method proved to be the most satisfactory. Temperature in these cases was generally of the quotidian type, which usually occurred at night and seldom rose to over 104° F. In a few of the cases a double rise of temperature occurred within the twenty-four hours, and the highest temperature reached was 104.5°, which was maintained for four hours. Rigors were, as a whole, less severe than those due to human malaria infection, and it is noteworthy that observations on the Arneth polymorphonuclear leucocyte count ascertained during the height of the infection showed a marked shift to the left, without the presence of a leucocytosis in the patient's blood.

Owing to the shortness of time during which we have observed the cases treated by *P. knowlesi* infection it is impossible to assess the value of this mode of therapy. Preliminary work, however, indicates that the ape parasite may ultimately prove to be an effective substitute for *P. vivax* in the treatment of G.P.I. In view of the mild nature of the infection which it produces in the human subject it appears to be eminently suitable for the treatment of elderly debilitated patients.

Clinical Effects

From observation of the foregoing cases some matters of clinical importance have been noted. Two-hourly charting is of paramount importance, for with four-hourly recording of the temperature the sudden onset and fall in temperature is liable to be missed. It should be noted that the rigors are moderately severe in nature, and cause considerable constitutional upset, and we recommend that this form of malaria therapy should be carried out in a hospital or institution where close personal contact is obtainable between the patient and the physician.

It would appear that digitalization of the patient is of great benefit, not only in cases where there is a grave cardiac lesion, but also where there is a possibility that the rigors may reveal latent circulatory damage. Ordinary standardized *B.P.* tincture has been used in these cases, but where there was any difficulty in tolerance, as in some cases, we have overcome this by using one of the trade preparations of the drug. We do not think there is any contraindication to this form of malarial treatment in cardiac cases unless the lesion is so grave—for example, auricular fibrillation—as to make treatment obviously impracticable. If signs of cardiac failure appear strychnine, hypodermically, in doses of 1/60 grain of the hydrochloride is recommended, on account both of its ease in administration and of its prolonged effect, as compared with adrenaline. We have found that brandy given in 1/2 ounce doses in hot water has proved a very useful prop to a failing pulse, and has been welcomed by the patient both for its strengthening and for its soporific effects. Diet in such cases should give no trouble. During the treatment patients were kept on ordinary light meals, such as soup, fish, a little meat, milk, eggs, etc., whilst fluids were given freely and as often as the patients demanded them. It was found that during the severe rises of temperature dryness of the throat caused considerable distress, but this was easily relieved by the administration of a little glycerin in water. Teaspoonful doses of castor oil every second day kept the bowels free, and at no time was there the slightest hint of gastro-intestinal upset.

Antimalarial Remedies

These observations are of interest, for we have found that atebrin has little or no effect on reduction of temperature or destruction of parasites during the acute stage, but would appear to be—alone or in conjunction with plasmoquine—a satisfactory drug for prevention of relapses during the convalescent period. On the other hand, there seems to be no doubt that quinine *per se* is the ideal drug for termination of these rigors. It rapidly causes a fall in temperature, and at the same time an almost dramatic destruction of parasites. Thus by careful observation of the patient and prompt administration of quinine there should be no possibility of the rigors going beyond control of the physician in charge. In no single case have we observed the occurrence of cerebral symptoms.

We would also point out that a comparatively small dose—namely, 7½ grains of the dihydrochloride intramuscularly with an equal amount of sulphate orally—is all that is required. Convalescence was quite uneventful. To prevent relapses a daily dose of 3 grains of atebrin with 1/2 grain of plasmoquine was given over a period of ten days, and during this time 10 grains of quinine sulphate were administered orally as a precautionary measure. To supplement atebrin and plasmoquine, digitalization was carried on for fourteen days, the dose being gradually reduced, and on the sixteenth day the patient was allowed out of bed.

Finally, it should be understood that these cases were nursed in an ordinary mental hospital ward, with no elaborate seclusion, screening, or other method; and that if given careful nursing, accurate charting, and regular observation by the medical officer, any risk in therapy appears to be reduced to a minimum.

Rate of Multiplication of *Plasmodium knowlesi* in Human Blood

Blood films were made at daily intervals from cases under treatment stained by Leishman's stain, and examined for the presence of parasites. The figures referred to in the text represent the number of parasites counted per field when examined under a × 600 magnification. Thus it was observed in Case I that after a preliminary incubation period of eight days the patient developed his first rigor, parasites appearing in his blood on that day, when an average of one per field was detected among several examined. Thereafter their presence was continuously noticed in the patient's blood throughout his illness, and even persisted for two whole days after atebrin-quinine therapy had been instituted. On the twelfth day the number of parasites had increased to three per field, and a few schizonts containing merozoites were first noticed, but there was no enlargement of the erythrocytes. The ensuing two days showed a sudden rise in their rate of multiplication, for on the fourteenth day sixty-eight per field were observed, and after a transient fall in numbers to thirty-five per field they again rose no fewer than 121 per field on the fifteenth day following infection. At this stage examination of the patient's blood revealed that the red blood cells had fallen to 2,500,000 per c.mm. and a slight leucocytosis (15,000 per c.mm.) was present. No further observations were accordingly made on the blood until

after his physical condition had improved, following the administration of antimalarial remedies.

These experiences emphasize the advisability of terminating the infection by the administration of quinine after the eighth rigor, in order to eliminate any possibility of harmful effects. This point was further illustrated in Case II. The patient was permitted to undergo nine rigors, and his blood showed a parasite count of 205 per field at this stage of the condition.

Pigment in the Large Mononuclear Leucocytes

After the administration of quinine the number of parasites seen in peripheral blood steadily diminished, so that on the twenty-fifth day after infection none could be found in the patient's blood. At this time a differential white cell count revealed the following percentages of these cells: neutrophil polymorphs 48, basophils 5, eosinophils 1, large lymphocytes 8, small lymphocytes 10, and large mononuclears 28. Several of the latter contained heavy deposits of dark brown pigmented material similar to that observed in human malaria by early workers such as Guarnieri and Bignami (see Marchiafava and Bignami—1894). There is no doubt that this pigment represents the remains of disintegrated parasites, for the large mononuclear cells contained ingested parasitized erythrocytes, and thus indicate the probable source of such material. Similar conclusions have been made with regard to the origin of the pigment in human malaria from the earliest of times, and Laveran (1893) alludes to "the existence of melaniferous cells which take possession of the debris of the parasitic elements and the pigment which they contain."

Transmissibility of *P. knowlesi*

In order to obtain experimental data, blood from Case III was injected into Case IV, and the disease successfully reproduced in this individual. Likewise the condition was serially propagated through three selected human subjects. It was also possible to reinfect the ape with human blood containing *P. knowlesi* after its serial passage through two human beings, and 5 c.cm. of blood from Case V proved infective to a healthy *M. rhesus* monkey (M.R. II) after ten days. It has been reported by Rowe *et alia* (1933)—also by Nauck (1934), who has investigated in great detail the susceptibility of *P. knowlesi* to chemotherapeutic agents such as atebrin, plasmoquine, and quinine—that atebrin acts as a powerful antimalarial remedy on the monkey suffering from *P. knowlesi* infection. One tablet of atebrin (0.1 gram) was accordingly given to the monkey orally, and three days later its blood contained less than one parasite per microscopical field among several examined. Eight weeks later, however, the animal relapsed, numerous parasites appeared in its blood, and despite the repeated administration of atebrin it died. It is of particular significance in this connexion that whereas atebrin appears to exert an antimalarial effect on *P. knowlesi* infection occurring in the monkey, it fails to have an analogous effect in combating similar infection of the human being. On the other hand, the powerful action of quinine dihydrochloride in the human case is of great interest, and this will be discussed in a later report. The foregoing experiments have demonstrated that *P. knowlesi* may be readily transmitted from monkey to man, man to man, or man to monkey with comparative ease.

Viability at 0° C.

On account of the practical importance of obtaining precise information regarding this aspect of the subject, it was decided to ascertain how long parasites would remain viable in monkey blood when stored in an ice-chest. An infected *M. rhesus* monkey was accordingly deeply anaesthetized, and 12 c.cm. of blood withdrawn by cardiac puncture, placed in a sterile test tube containing glass beads, and defibrinated by gentle shaking. The blood was thereafter kept at 0° C. for eight days, after which 5 c.cm. was injected intramuscularly into Case IX, and the remaining 5 c.cm. replaced in the ice-chest for a further eight days, following which it was introduced into a healthy *rhesus* monkey (M.R. III). The results showed that the parasites retained their viability throughout his period, for they proved pathogenic to the human subject as well as to the ape, both of whom developed the characteristic disease. We have thus found that blood removed from an infected monkey and stored in an ice-chest at 0° C. retains its pathogenicity for the human individual for eight days and to the ape for sixteen days.

Advantages as a Pyrotherapeutic Remedy for G.P.I.

From the clinical standpoint four striking advances are immediately apparent. First, the inoculation period is a comparatively short one of eight to nine days, or even less. Secondly, the gentle onset of pyrexia and the gradual increase in temperature with each quotidian rigor are highly desirable features that facilitate the nursing and observation of these patients. Thirdly, pyrexia may be instantly terminated by the exhibition of quinine should any latent intercurrent infection become manifest during the course of therapy. The efficacy of quinine dihydrochloride is adequately illustrated in Cases I and II, as well as others which have not been described in detail; for as little as 7½ grains of the drug given intramuscularly is sufficient to deal with a massive infection. Fourthly, it should be remembered that blood obtained directly from the infected monkey, in contradistinction to that obtained from a case of G.P.I., is free from syphilitic infection, and is consequently available for the treatment of disseminated sclerosis and other conditions for which Wassermann-positive blood is deemed unsuitable. In conclusion, the viability of *P. knowlesi* at low temperatures renders it possible to store blood in an ice-chest and use it when required, the convenience of which will be immediately appreciated.

Summary and Conclusions

1. The naturally occurring malaria parasite of the monkey (*Plasmodium knowlesi*) has been transmitted to twelve human beings.

2. The infection has been communicated from one man to another in direct series, and three passages have been effectively carried out.

3. Ape malaria infection of man is characterized by an incubation period of three to fourteen days, followed by pyrexia of the quotidian type that usually occurs at nights. A double rise of temperature within twenty-four hours has also been observed.

4. A marked shift to the left of the Arneth polymorphonuclear leucocyte count has been noticed during the course of ape malaria in man.

5. The monkey parasite *P. knowlesi* has been successfully used for the treatment of general paralysis of the insane.

6. The data concerning the rate of multiplication of *P. knowlesi* in the human subject are recorded. Our findings indicate that it is inadvisable to continue the course of treatment after a patient has had eight rigors.

7. Although the drug atebrin acted specifically in the monkey, its administration failed to diminish the pyrexia or inhibit the multiplication of parasites in cases of human infection.

8. Quinine dihydrochloride exerts an immediate action on ape malaria infection in man, and a single intramuscular injection of 7½ grains is sufficient to reduce fever within an hour.

9. Infected monkey's blood, when stored in an ice-chest at 0° C., retains its pathogenicity for the human subject for eight days and for the monkey for sixteen days.

Acknowledgements

We are indebted to Dr. J. H. C. Orr of Rosslynlee Asylum and to Dr. R. C. L. Batchelor of the Royal Infirmary, Edinburgh, for permission to publish the case notes referred to, and to Sir Rickard Christophers of the London School of Tropical Medicine and Hygiene for many helpful suggestions; also to Professor A. J. Clark of Edinburgh University and Professor E. G. Nauck of Hamburg Tropical Diseases Institute for information concerning the action of drugs.

Bibliography

Knowles, R., and Gupta, B. M. Das: *Indian Med. Gaz.*, 1932, lxvii, 391; *Bull. Trop. Med. and Hyg.*, 1932, xxix, 701.
Laveran, A.: *Paludism*, New Sydenham Society, London, 1893, cxlvi, 118.
Marchiafava, E., and Bignami, A.: *Summer-Autumn Malarial Fevers*, New Sydenham Society, London, 1894, cl, 174.
Nauck, E. G.: *Arch. f. Schiffs- u. Tropen-Hygiene*, 1934, xxxviii, 313.
Row, R., Dalal, N. P., and Gollerkeri, G. V.: *Trans. Roy. Soc. Trop. Med. and Hyg.*, 1933, xxvi, 469.
Sinton, J. A., and Mulligan, H. W.: *Record of the Malaria Survey of India*, 1932, iii, 358.

Clinical Memoranda

Absence of Pericardium

I am reporting this case of absence of the pericardium on account of its rarity.

Case History

A male, aged 35 years, labourer, had been suffering from cardiac insufficiency for several years. When first seen, a few months before his death, he was suffering from heart failure. The pulse was regular and a bit rapid, and he was cyanosed and dyspnoeic. The cardiac pulsations were seen and felt all over the lower half of the left side of the chest, and the heart sounds were loud and heard practically all over the left side of the chest—from the front, back, and side. No definite murmurs were heard. There was marked expansion and retraction of the left side of the chest, and the case was diagnosed as one of adherent pericarditis. The patient was treated with digitalis, with little improvement. It was then decided to perform the operation of cardiolysis, but the patient died suddenly at the beginning of the anaesthesia.

Pathological Findings

On post-mortem examination all the viscera were found to be the seat of marked chronic venous congestion. The heart was found occupying nearly the lower half of the left side of the chest, compressing the lung upwards. The pericardial sac was absent, except for a small triangular piece at the emergence of the great vessels in front, and the heart was lying quite naked in the pleural cavity. There were no adhesions at all. The heart was quite smooth, and showed few small milk spots.

On removing it from the chest it was found to be nearly four times the size of a usual heart at that age. The enlargement was due to marked dilatation of all the chambers.

No valvular lesions were seen, and on the whole it did not show any abnormality except the dilatation. It weighed one kilogram.

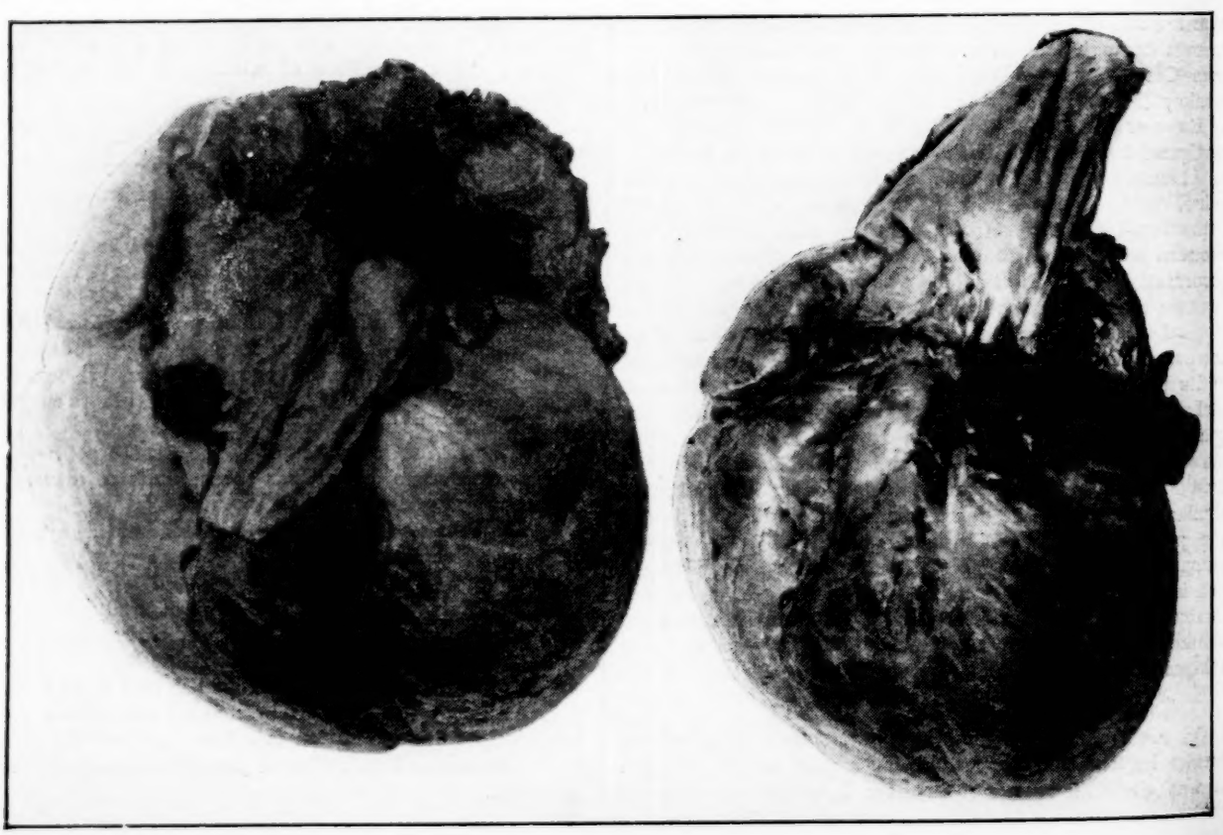
Comment

As one of the functions of the pericardial sac is to prevent the dilatation of the heart during exertion, we can easily understand how this one became so markedly dilated.

Congenital absence of the pericardium occurs, but is of extreme rarity.

The photographs show the heart as seen from the front, with the small triangular piece of the pericardium seen *in situ* in Fig. 1 and reflected upwards in Fig. 2.

H. Barsoum, M.R.C.P., D.T.M. & H.
Pathologist, Government Hospital, Alexandria, Egypt



Reviews

THE ENDOCRINES AND THEIR DISORDERS

The third and enlarged edition of Professor H. Zondek's book *The Diseases of the Endocrine Glands*[1] is published in English, the author having left Germany. It is primarily designed for the clinician, and is based on certain fundamental hypotheses which may be stated thus: the effect of a hormone is a variable quantity, depending on the condition of the organ on which it acts at the moment; changes in endocrine glands should not always be regarded as the cause of disease, for such changes may be a response to morbid processes located in other organs; the endocrine system is but one link in the chain of the vegetative functions of the organism. In this way the author provides a useful corrective to the tendency to overestimate the role of hormones.

Historically it is interesting to note that in 1775 Bordeu wrote: "Every organ serves as a workshop for the preparation of a specific substance which enters into the blood; such substances are useful to the body and are needed in order to maintain its integrity." Here, indeed, was the germ of the idea of internal secretion, which was, however, to lie dormant for more than a century. For although Claude Bernard is generally regarded as the originator in 1885 of the idea of internal secretion, his conception was limited to the maintenance of a constant composition of the blood by this means. Brown-Séquard started the modern interest in the subject, though his data were both inadequate and inaccurate. When in 1905 Starling introduced, at Hardy's suggestion, the word "hormone" for the chemical messengers produced in ductless glands, the name gained immediate and general acceptance. Schäfer pointed out that, by derivation, this term should be restricted to stimulating substances, and tried to introduce the name "chalones" for secretions having an inhibitory effect; but all in vain—the first-comer was already an established favourite.

One of the most interesting sections of the book is that dealing with the general mode of action of endocrines. Organisms primitively responded to chemical stimuli before a centralized nervous system was evolved, and we are accustomed, therefore, to think of the endocrines as a persistent but specialized form of chemotaxis. But we are reminded that phylogenetically the endocrine gland system was a comparatively late arrival. With phylogenetic development reaction to the hormones becomes more and more specific. While appreciating the value of Dodds's work on synthetic compounds of anthracene which can induce effects similar to those of the natural hormones, Zondek will not admit this as an argument against the specificity of the hormones generally. He thinks that in itself the fact that they can produce marked generalized effects in such minute quantities indicates that they act as catalysts. Their activity seems apparently to depend upon the integrity of cellular structure; they are *physical* catalysts. Apparently the hormones circulate in the blood in an inactive form; not until they reach the organ of their destination, where they are adsorbed, do they become activated. The adsorption of a hormone is regularly decreased in the presence of narcotics, which are able to adhere to the cell surface and to displace the hormone from it. This throws a new light on the value of sedative drugs in the treatment of hyperthyroidism.

The author also has views on the method of the admitted association between the vegetative nervous system and the endocrine glands. He claims that excitation of the vagus may result from an increased concentration of potassium ions, and excitation of the sympathetic from that of the calcium ions. It would carry us too far into fields of speculation, however interesting, to discuss the connexion between this and Dale's work on cholinergic and adrenergic fibres, or its bearing on the rhythmical functions of the body. But we are left with the feeling of imminent discovery, of baffling problems on the verge of solution.

With appetite thus whetted, we can go on to the exposition of individual endocrine disorders, fully described and well illustrated. This part will appeal to the practising physician, written as it is by a man of wide clinical experience. But some of us will return again to those opening chapters, so thought-provoking and so full of promise for the future. The book is well translated by Dr. Carl Prausnitz, though occasionally constructions more Teutonic than English obtrude themselves.

[1] *The Diseases of the Endocrine Glands.* By Hermann Zondek. Third edition, revised and enlarged. Translated by Carl Prausnitz, M.D.Breslau, M.R.C.S., L.R.C.P. London: Edward Arnold and Co. 1935. (Pp. xii + 492. 168 figures. 40s. net.)

MELLOR'S INORGANIC CHEMISTRY

This remarkable compendium of inorganic chemistry[2] is now nearing completion. Thirteen volumes have already appeared and the fourteenth is now ready. The fourteenth volume completes the chemistry of iron and enters on the subject of cobalt. The general character of the book has already been described in these columns. It will suffice here to remark that there is nothing else like it in the domain of inorganic chemistry for its all-embracing comprehensiveness. Perhaps the most astonishing thing to anyone first perusing the work is to find how much more extensive has been the research in various branches of chemistry than he was hitherto aware of. But no less astonishing is the work of Dr. Mellor in collecting and sorting the harvest of facts and then assembling them in a connected form. Here will be found not only the description of chemical reactions and rare chemical compounds, but such exhaustive and diversified details as the velocity of sound in cobalt; the temperature coefficient of its electrical resistance and its occurrence and distribution in many forms of vegetation, including the fact that the kernel of decorticated and polished rice is extremely poor in cobalt. Even the physiological action of cobalt salts is noticed, and there are upwards of thirty observations recorded of their effects. This work can only be appreciated to the full by a full perusal.

OSLER AND McCRAE'S MEDICINE

The issue of the twelfth edition of Osler's *Principles and Practice of Medicine*[3] almost coincided with the death, after a severe operation, of the editor, Professor Thomas McCrae of Philadelphia, who had collaborated with Sir William Osler before the latter's death and brought out the subsequent editions of this favourite textbook. The first edition appeared in 1892, two years after the textbook by the late Sir Frederick Taylor, which in 1930 went into its fourteenth edition, under the guidance of Dr. Poulton. Like another famous textbook from Guy's Hospital—that by Hilton Fagge, which was brought out in 1886 by Dr. P. H. Pye-Smith and soon succeeded in general favour J. S. Bristowe's *Theory and Practice of Medicine* (1876)—Osler's book had the appeal of much

[2] *A Comprehensive Treatise on Inorganic and Theoretical Chemistry.* Vol. xiv (Fe (Part III) Co.). By J. W. Mellor, D.Sc., F.R.S. London: Longmans, Green and Co. 1935. (Pp. 892; 277 figures. 63s. net.)

[3] *Principles and Practice of Medicine.* Originally written by the late Sir William Osler, Bt., M.D., F.R.S. Twelfth edition. Revision by Thomas McCrae, M.D., F.R.C.P. New York and London: D. Appleton-Century Company, Inc. 1935. (Pp. xxvii + 1193; 22 charts and illustrations. 30s.)

personal experience; it had also other attractions, as was shown by, what must be a unique experience for a medical textbook, two examination papers set on the allusive text (after the manner of Calverley's Pickwick Examination paper) in 1904 and 1927 at St. Thomas's Hospital. Professor McCrae loyally retained many of the Oslerian *obiter dicta* while judiciously selecting what seemed true from that which was merely new, for he rightly held that a textbook is not a yearbook and should not be blown about by every wind of doctrine.

The present edition has been entirely reset so that each page contains more words: thus, though there are some forty pages less than in the last edition in 1930, a large number of additions have been made, more especially on the rapidly changing subject of anaemia. Among these is an account of achresthic anaemia, described this year by Wilkinson and Israëls, in which, though in some respects resembling Addisonian anaemia, there is free hydrochloric in the gastric juice, absence of nervous complications, and a poor response to specific treatment. In the preface the editor wrote, "We cannot be Oslers, but we can do our best to follow his steps": this has been his life's lodestar, and all who knew him and his work will sadly regret that this, so well accomplished, is his last task.

RADIOGRAPHY OF RHEUMATIC ARTHRITIS

In the nature of things skiagrams might be expected to be of diagnostic service in the study of diseases of the joints, and in his *Radiological Atlas of Chronic Rheumatic Arthritis*[4] Dr. S. Gilbert Scott very effectively demonstrates to what extent this expectation can be realized in practice. He adopts the maxim that "the hand is the visiting card of the rheumatic patient," and his thirty plates are all pictures of the hands of individual patients, this being in harmony with the doctrine that here early and distinctive radiological evidences of arthritic changes are to be found. Each plate is accompanied by a brief clinical description of the corresponding case; the special facts are emphasized; and the radiological diagnosis is indicated. This diagnosis, it is to be noted, is not always in agreement with the label attached to the case by the clinical observer, and Dr. Scott naturally gives the last word to the skiagram, which he urges has a further value—namely, the ability to detect and to demonstrate the earliest manifestations of changes in the bone and joint structures.

The atlas is more than a mere record of facts and of individual case records. The pictures presented are selected from an unnumbered multitude, and are grouped as showing the several individual changes which justify the identification of four varieties of chronic joint disease—namely, rheumatoid arthritis, osteo-arthritis, chronic infective arthritis, and gouty arthritis. There is obviously a confidence and decision about this grouping, with its definite pictorial basis, which is very appealing; it contrasts favourably with many academic discussions; and with existing skiagraphic resources it can be put to the test. But does the scheme tell the whole truth? On this point it is noteworthy that in climacteric arthritis, which certainly has an established clinical position, Dr. Gilbert Scott failed to find in skiagrams of the hand any constant or characteristic change, and hence this variety of disease does not fall into his scheme of classification. Nevertheless, even allowing this exception, there can be no doubt that his atlas, with its effective pictures, lucid descriptions, and doctrinal comments, fully demonstrates his contention that in the diagnosis of chronic arthritis the skiagram has an important word, if not the last word, and that through its capacity to demonstrate early change it may make an important contribution to effective treatment. Dr. Gilbert Scott deserves the gratitude of the profession, and the value of his study will, we feel sure, be widely recognized.

[4] *Radiological Atlas of Chronic Rheumatic Arthritis (The Hand).* By S. Gilbert Scott, M.R.C.S., L.R.C.P., D.M.R. and E. London: H. Milford, Oxford University Press. 1935. (Pp. 76; 30 plates. 25s. net.)

FESTSCHRIFT—INO KUBO

Many friends and admirers of Professor Ino Kubo have come forward handsomely with contributions to the *Festschrift*[5] in honour of his sixtieth birthday. This institution, which is more honoured abroad than in this country, has in this instance proved to be the occasion for drawing a most remarkable collection of nearly fifty papers and essays from every part of the globe. The languages used are German, French, and English, the majority of the writers using German. In some instances the writer has given a short review of work for which he is well known. In this class are: Explorations of the Paranasal Sinuses, by Dr. Watson-Williams; and Carcinoma of the Upper Jaw, by Professor Holmgren. In others the writer has given a useful account on some limited subject such as: Technical Difficulties in the Mastoid Operation, by Professor Beyer; The Aquaeductus Cochleae as the Conducting Path of Purulent Infection, by Kelemen; and the Treatment of Vasomotor Rhinitis, by Professor Schmiegelow. There are also some short papers of great interest on rare cases, such as Lipoma of the Larynx, by Dr. Birkett, with a good bibliography; A Case of Riedel's Thyroid, by Professor Spiess; Bilateral Symmetrical Giant Keloid of the Lobules of the Ears, by Professor Belinoff; and Isolated Larygeal Tuberculosis, by Dr. Ove Strandberg.

Included also are papers which are the result of definite research, such as those on the Frontal Sinus, by Dr. Van der Hoeven Leonard; and the Influence of the Radioactive Stimulants on the Innervation of the Blood Vessels, by Dr. Muck. These examples show how varied are the subjects chosen by their distinguished authors. The book is handsomely produced, and contains an excellent portrait of Professor Kubo.

TREATMENT OF FRACTURES AND DISLOCATIONS

Traitement des Fractures et Luxations des Membres,[6] by Jacques Leveuf, Charles Girode, and Raoul-Charles Monod, compresses into a short space a brief description of all the more modern methods employed in the treatment of fractures. It is essentially practical, and the details of procedure are illustrated by admirable sketches which show the points required and save pages of difficult explanation. So good, in fact, are the sketches that any surgeon glancing through the book will pick up technical details of value even though he possesses no knowledge of French.

Starting with a brief description of the methods of first aid and of reduction, the authors describe the various practical means employed in the general treatment of fractures, the production of plaster casts, the methods of anaesthesia, and the operative technique of securing fractures by bands, plates, and other appliances. This preliminary section is followed by a detailed discussion of the application of these measures to special fractures, and again the illustrations render perfectly clear all the procedures described.

[5] *Festschrift. Ino Kubo.* Zu Seinem 60 Geburtstag (26 Dezember, 1934), von Seinen Auslandischen Freunden Gewidmet. Tokyo: The Herald Press, Ltd.

[6] *Traitement des Fractures et Luxations des Membres.* By Jacques Leveuf, Charles Girode, and Raoul-Charles Monod. Second edition. Paris: Masson et Cie. 1935. (Pp. 442; 313 figures. 50 fr.)

The second part of the book deals with dislocations, methods of reduction, and methods employed in preventing recurrence in, for example, dislocation of the shoulder. Particularly elegant are the descriptions of the procedures in dislocations of the fingers, and the illustrations are as neat as the procedures described. The volume should be of great value to those who are engaged in the practical care of fractures, a subject the importance of which is every day being more fully recognized.

Notes on Books

In *Living Things*,[7] by Richard Palmer, lecturer in Education in the University of Liverpool and late Assistant Lecturer in Zoology at University College, London, we have an introduction to biology on better lines than usual. Even so, the author still feels compelled to have examination requirements very much in view, although he very sensibly says: "Examinations are stiles in the path of culture. We can march a child along a narrow path with a stile as his sole objective. He may cross it successfully, and we congratulate him on his knowledge of the country he has traversed. Yet all he may really have learnt is the way to the stile, which soon becomes a trivial memory as he faces the broad plains of manhood." The content and arrangement of the volume are more satisfactory than in many other textbooks in two respects. Throughout the greater part of the book animals and plants are considered in close conjunction, and the separation into botany and zoology is minimized rather than stressed. Further, the method of instruction is not based upon the progressive dissection or description of a large number of types of organisms; such subjects as the action of enzymes and vitamins and the history of the chromosones during reduction and fertilization are introduced relatively early and in some detail; and suitable emphasis is placed upon such general questions as the methods of organic evolution and the influence of environment and heredity. Moreover, the author concludes with a useful chapter on "The Methods of Science," which he describes as "frankly an experiment." He believes that many children can be taught "to recognize the logical shape of a problem irrespective of its factual content," and that this is well worth while. He suggests that the whole book should be read through and studied as a whole, even though there will be some parts of it which are not required for any specified examination. It is intended mainly for use in secondary schools, where, even if many pupils leave at the age of 16 years, biology is being increasingly taught.

A summary of arterial blood pressure,[8] a subject still much under discussion, has been written by a professeur agrégé of Paris, Dr. E. Donzelot, who is mainly responsible for the 125 pages of the text, and Professor Kisthinios of Athens, who has provided a bibliography of thirty-five pages. After an account of the normal machinery of arterial pressure and the means of estimating it, among which may be mentioned Professor Donzelot's arteriotensiometer as shown on a plate, the subject of hypertension is taken up. The aetiology of permanent and of paroxysmal high blood pressure is cautiously discussed from various points of view: thus most of the endocrine glands have been suspected, but not with equal reason. In favour of ovarian responsibility it is urged that hypertension commonly appears at the menopause, especially after early ovariotomy, its association with uterine fibromyomas, and with eclampsia. While the causation of hypertension remains an open question, it is impossible to set up any specific form of treatment, but a summary of the various methods and drugs is given. The subject of hypotension is similarly epitomized in a systematic manner.

[7] *Living Things. An Introduction to Biology.* By Richard Palmer. London: George Allen and Unwin, Ltd. 1935. (Pp. 400; 182 illustrations. 7s. 6d.)

[8] *La tension artérielle (maxima, moyenne, minima): L'hypertension, l'hypotension et leur traitement.* Paris: J. B. Baillière et Fils. (28 fr.)

A third edition has now been issued of the *Laboratory Manual of Physiological Chemistry*, by Professor Meyer Bodansky and Dr. Marion Fay of the University of Texas (Chapman and Hall, 10s.). The general scope of the original edition of 1928 is retained, but some rearrangement was thought appropriate in the order of the experiments. Since the properties of the colloidal systems cannot be adequately treated in so small a manual the chapter on colloids has been omitted. The chapter on the blood has been thoroughly revised.

Youth, Sex, and Life, by Dr. Gladys M. Cox (C. Arthur Pearson, 3s. 6d.), is a sensible, straightforward little book, written for young people and their parents by a medical woman who has had much experience in advising the married and unmarried. Her general attitude, with which few educated people will disagree nowadays, is expressed in the following sentence: "Sex should take its place in the general scheme of life, and should not be dealt with as an isolated subject in an atmosphere of secrecy and furtiveness and complicated by all kinds of emotional difficulties."

Preparations and Appliances

MANDELIC ACID TREATMENT

The B.D.H. outfit for mandelic acid treatment represents an interesting departure in therapeutics. It consists of a case containing a supply of tablets of mandelic acid and capsules of ammonium chloride, also a test tube, a dropping pipette, and a bottle of methyl-red indicator. The drugs thus supplied are adequate for fourteen days' treatment, and the provision of the indicator greatly facilitates the estimation of the effect produced by the ammonium chloride. The outfit is accompanied by a brochure giving an account of the value of mandelic acid in cystitis and details regarding its therapeutic use. It therefore provides the practitioner with everything he needs for carrying out this new method of therapy. The only addition we could suggest would be the provision of a colour scale showing the indicator colours when the urine is correctly acidified and when there is insufficient or excess of acid. The whole outfit is supplied in a compact and attractive case, and may be had from British Drug Houses, Graham Street, City Road, London, N.1, price £2 2s., with a 10 per cent. reduction for medical practitioners.

CONCENTRATED SOLUTION OF PROSTIGMIN

The Hoffmann-La Roche Chemical Works Ltd. (51, Bowes Road, N.13) inform us that in order to provide supplies of prostigmin (see *British Medical Journal*, March 9th, 1935, p. 463) for the use of hospitals and practitioners who require to give large doses, a new packing has been introduced. This consists of a 5 c.cm. rubber-capped phial of concentrated solution, each c.cm. being equivalent to 2.5 mg. of prostigmin substance; 1 c.cm. of this concentrated solution is therefore equivalent in potency to five ordinary prostigmin ampoules.

LEGIBLE CLINICAL THERMOMETERS

The Industrial Thermometer Company (83, Great Saffron Hill, Clerkenwell, E.C.1) are introducing into this country clinical thermometers made by a patent process, which shows the mercury column in red or blue by reflection from a strip of coloured glass at the side of the tube. This makes the temperature reading much more legible, and remedies a shortcoming often felt by doctors and nurses. The patentees of the "red-reading-mercury glass" are the Palmer Company of Cincinnati, Ohio, U.S.A.

KALDROX

Kaldrox (Petrolagar Laboratories Ltd., Braydon Road, N.16) is a preparation which contains in suspension 20 per cent. colloidal kaolin and 2.5 per cent. aluminium hydroxide in the form of a gel. The preparation is the result of a search for a chemically inert substance which would act as a powerful adsorbent in the alimentary canal. Kaolin has long been used for this purpose, and it was found that kaolin was activated by the addition of aluminium hydroxide. Clinical experience has confirmed the fact that kaldrox is a more powerful adsorbent than kaolin alone. Kaldrox acts as an antacid in the stomach by adsorbing the acid, and in the intestine it acts as an adsorbent for products of putrefaction. It is recommended for gastric hyperacidity, colitis, intestinal putrefaction, etc.

INDUSTRY INTERVENES

BY

ELWIN H. T. NASH, M.R.C.S., L.R.C.P., D.P.H.

MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER, BOROUGH OF HESTON AND ISLEWORTH; HONORARY FELLOW, AMERICAN STOMATOLOGICAL ASSOCIATION

I am impelled to chronicle the following case because: (1) although the pioneer orthodontic clinic which I was able to institute by the enlightened outlook of my Borough Education Committee has been running for five years, this is the first case in which, during that period, industry has intervened by reason of the inability of the sufferer to carry out his duties; (2) in discussing orthodontics with general practitioners I find there is a general lack of understanding as to how much can be accomplished in the way of correction of deformities. I find also that there is a serious want of appreciation of the dire results that ensue from such habits as thumb-sucking, finger-sucking, blanket-sucking, etc. In children other than those who attend the maternity and child welfare clinic of the local authority, these results are only seen by the general practitioner as the family adviser, and he must be the person either to prevent the deformity by controlling the habit or to see that the patients are treated if the deformity is established. The age of onset of the deformity of course varies; the sucking deformities are produced early, but can only be dealt with at the same time as the hereditary ones—that is, at eruption of the second dentition at the age of ten or thereabouts. Professor Brash has pointed out how large is the proportion of these deformities that are hereditary in origin.

Importance of Dental Deformities

The physical injury that afflicts these sufferers is nothing to the psychological injuries. Many of them carry an inferiority complex throughout life as the result of their deformity, and some have their early days at school made utterly miserable by the cruelty of the remarks of their schoolfellows. Only recently I was talking to a late president of the Oxford Union, the possessor of a very marked inferior retrusion, who said his whole preparatory school days were made miserable by his dental deformity and his later years a constant worry owing to dental trouble and the impossibility of being fitted with an artificial denture.

It is true that orthodontic treatment has only assumed its real importance in the dental profession in comparatively recent years; but all dental students are now being adequately trained, and there should be in almost every district someone capable of dealing with the simpler, if not the more difficult, orthodontic deformities. The responsibility for seeing that these cases are treated must be with the family doctor, as he is the only person, other than the school medical officer's staff, who has access to the child, and, what is most important, the confidence of the parent.

To those who have not seen cases of these deformities it is difficult to appreciate (*a*) the difference in the mouth as a masticating machine and an asset to health, and (*b*) the psychological improvement as a result of the removal of the obvious deformity. One of the outstanding things that have been made manifest by this municipal clinic is that the mother with a bad congenital deformity, which has been the origin of a marked inferiority complex, will spare neither pains nor expense to see that her daughter to whom she has handed down the affliction is relieved of the deformity which spoilt her own life.

Case Report

The case now reported was that of a boy who, just before the age of 11, came under our orthodontic clinic. The condition of his mouth at that time is shown in Figs. 1 and 3. Except to the understanding, the condition does not appear to be one warranting the most careful and, if necessary, prolonged treatment to ensure a satisfactory denture. Shortly afterwards, before treatment had begun, the boy won a county council scholarship and passed into the county secondary school out of my jurisdiction, and as this pioneer orthodontic clinic was at that time the only clinic in the county where organized orthodontic work was being carried out, nothing was done for the boy, although he was medically inspected at school in the ordinary routine manner.

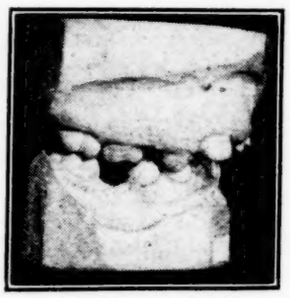


FIG. 1.

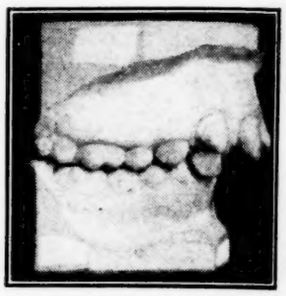


FIG. 2.

FIG. 1.—Model showing lateral view of patient's mouth on April 24th, 1930, shortly before he obtained a scholarship.

FIG. 2.—Model showing lateral view of patient's mouth when brought by his mother to see the school medical officer on November 24th, 1934, after leaving school.

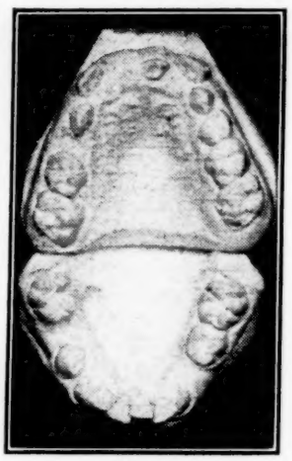


FIG. 3.

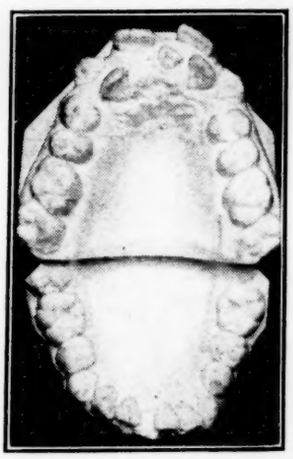


FIG. 4.

FIG. 3.—Model of upper and lower bite on April 24th, 1930.

FIG. 4.—Model of upper and lower bite on November 24th, 1934.

No one seems to have taken any notice of his increasing dental deformity, and nothing was done until, on the morning of November 24th, 1934, his mother brought the boy to me and stated that he had started on the previous Monday in an insurance office as an interviewing clerk, and because of his trouble with his mouth in his attempt to cover up the dental deformity his chief told him it was impossible for him to carry out his duties properly. (See Figs. 2 and 4.) She asked me what I could do for the boy, and my answer had to be "Nothing," by reason of the fact that he had left school and passed under the jurisdiction of the County Education Authority as he had passed out of ours in 1930. Also I had to tell her that by reason of his age there was little, in fact very little, chance of doing anything really beneficial.

I remembered, however, that Mr. Breeze, jun., had exhibited the results he had achieved in the case of a cinema actress who came to him at the age of 18. I therefore arranged that

Mr. Evans, our orthodontic specialist, should see him as a patient at the Royal Dental Hospital. The supernumerary teeth have been extracted and some improvements have taken place, but—and here is the tragedy—this boy's mouth if he had been less endowed with brains and remained under the charge of our orthodontic clinic would have had an almost normal-looking and functioning denture.

Deformities Due to Thumb-sucking

I find also that there is another class of deformity that develops as a result of this habit of thumb-sucking. The thumb-sucker (Fig. 5) pushes the upper front teeth outwards and the lower front teeth inwards in a much more marked way than the most persistent dummy-sucker. The child whose models are shown herewith (Figs. 6 and 7) is the elder of two, aged 3½. The father is a chronic invalid, and the mother has been only too glad to keep the children quiet by letting them suck their thumbs.

Fig. 5.—Thumb-sucker's mouth.

Fig. 6.

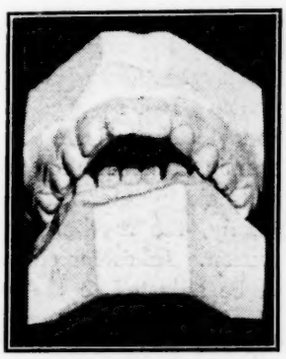


Fig. 7.

Fig. 6.—Model of lateral view of child's mouth showing severe deformity produced in the region of the upper incisors, together with the pushing in of the lower central incisors.

Fig. 7.—Front view of the model of patient's mouth, which shows the gap produced by the pushing out of the upper incisors, and also shows better than the lateral view the pushing in of the lower incisors.

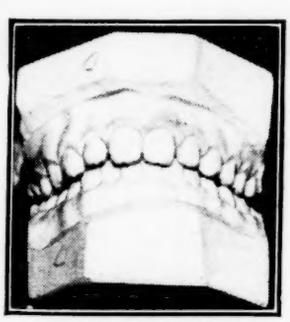


Fig. 8.

Fig. 9.

Figs. 8 and 9 show the models of a similar case—namely, the deformity is due to thumb-sucking.

The models of the elder child's mouth show the great protrusion of the upper incisors and the inward slope of the lower incisors, and the front view shows the permanent open bite.

Figs 8 and 9, anterior and lateral views, show what can be accomplished in other cases of deformity due to thumb-sucking. It will be seen that the open bite has been closed up ; the protruding incisors in the upper jaw have been brought back into place by means of a Badcock expanding plate carrying a labial wire, the expansion plate widening the arch to make room for the retraction of the protruding teeth, bringing them into perfect alignment. The lower incisors were pushed out into their proper position by means of a plate carrying screws, which were given half a turn every other day by the child's parent. We find in this clinic that we have no trouble in persuading the parent to move the screws, thus saving her time and money in coming up to the clinic for this purpose.

Conclusion

I am not going to enter into the administrative details that have been devised to make the clinic possible, beyond stating that we have had 700 cases under treatment and that the total cost to the parent was at first 37s., but since the authority's orthodontic specialist is now a member of my staff it has been reduced to 25s., which includes as many plates, bands, or other apparatus as are necessary for full treatment. There is no day but what I see, as I pass along the streets of London, mouths "crying out" for the treatment that should be made available to them. If any practitioner cares to see the clinic at work and he writes to me, I will arrange an appointment.

According to M. Bustamante, G. Varela, and F. R. Neri (*Bol. ofic. sanit. Panamericana*, May, 1935, p. 511), in January, 1934, an outbreak of typhus occurred in San José del Pacifico, a Mexican village with a population of 507 inhabitants, who never washed or changed their clothes, and were infested with head and clothes lice. Before the serum was used there had been 198 cases and thirty-two deaths. Injections were commenced in August, when there were forty-two cases and ten deaths. In September there were nine cases and one death, and in the next three months there were no cases at all. The serum was prepared by injecting white rats intraperitoneally with an emulsion of the tunica vaginalis of guinea-pigs infected with Mooser's endemic Mexican strain. Horses were injected intravenously with the washings of the peritoneal cavity of the rats so treated. Experiments on guinea-pigs showed that the serum thus obtained possessed prophylactic properties if injected seven to thirteen days before the injection of the typhus virus, the protection lasting for one month. Villagers to the number of 169 were injected subcutaneously with 5 c.cm. of the serum (149 with a single dose, and twenty with two doses), while thirty-nine who refused to have the treatment served as controls. The results were as follows. Thirteen of those injected (7.69 per cent.) developed typhus within sixty days, as compared with 9 (23.07 per cent.) of the controls. The fatality was *nil* among those injected, although ten of those who had had one injection, and three of those who had had two injections, contracted the disease, whereas six of the non-injected cases were fatal. The fact that 1.7 per cent. of those who had had only one injection, and 15 per cent. of those who had had two, contracted typhus after the lapse of fifteen days from injection, shows that the passive immunity conferred lasts about a fortnight.

British Medical Journal

SATURDAY, OCTOBER 12th, 1935

RHYTHM OF BODY FUNCTION

This is an age of movement. Men are no longer compelled to spend their lives in one place working at the trades they have learned from their fathers. Scientific advances have brought, with improved means of communication, interchange of people and diversity of methods. Along with this change in the current philosophy of the man in the street there has been noticeable in medicine a change of attitude towards medical problems. The dominating role of normal and pathological anatomy, the era of cellular pathology, has passed. At the bedside attention is now given to the function of the patient and his organs, in order that, so far as that function is diminished or altered by disease, it may be aided or restored. This postulates a knowledge of the functions in health, and much time has been spent in investigating the functions of the large glands such as the liver, and the whole series of phenomena included in the term "metabolism." Physiologists have accepted the old views that the liver cells are put into activity when there is work to be done, and that this activity therefore follows the ingestion of food. In a recent publication[1] Dr. Erik Forsgren has urged that too rigid a view of the liver cell and its work has been taken. He brings forward evidence that there is a rhythmic alteration in the working of the liver; that a stage of assimilation, during which the cells take up raw material for their activity and store it, is followed by a phase of secretion and eventually extrusion of the accumulated secretion. These changing phases are not controlled essentially by intake of food, but there is a slow fundamental diurnal rhythm upon which the food-secretion rhythm is superimposed.

These conclusions are arrived at from a study of the minute histological details of liver cells from rabbits and white mice killed at different times during the twenty-four hours. It was noted that in control animals feeding times tended to be in the afternoon and evening, and sleep from midnight till 8 a.m. Animals killed during certain times of the day showed an absence of glycogen in the liver, even though food was lying in the alimentary tract; while animals killed after eight or twenty-four hours' fasting may have much more glycogen in the liver than those which had only fasted for five or six hours. Forsgren found that rabbits and white mice showed an assimilation or accumulation of glycogen in the liver during the early hours of the morning and a secretion or diminution of glycogen during the day. It may be objected that during the day the animals are more active and so use up more glycogen from the liver store; but the rabbit is a nocturnal animal, and the author finds that with his experimental animals, having regard to the fundamental twenty-four-hour rhythm, work and activity have little or no regular effect on the glycogen content of the liver. His further argument in favour of his thesis, that glycogen disappears from the liver in spite of insulin injection, cannot be thought very effective until clearer notions are established concerning the effect of insulin on glycogen storage in the normal and diabetic animal. In a further series of experiments on animals and observation of a few patients with biliary fistula, Forsgren finds a similar diurnal rhythm in the secretion of bile which is only partially affected with secondary waves by taking meals. He makes an immediate appeal that liver of animals killed for food should be taken at the height of the assimilatory period in order to improve the size, consistence, and taste of the liver. But a much wider and more interesting implication is when the diurnal rhythm is related to other similar rhythms in the animal body—the twenty-four-hour variations in urinary secretion and in body temperature. Even the organic constituents of the urine, so far as nitrogen and urobilin are concerned, show a rhythmic variation in their excretion. If his suggestion that glycogen ebbs and flows in the liver is confirmed in the diabetic, the times of insulin administration may be able to be adjusted so as to aid in enforcing the rhythm.

Finally, the rhythm of sleep is brought into consideration. In colder climates where the working day must be adjusted to the hours of daylight, especially in the winter time, there may be an artificial and deleterious disruption of the natural rhythm of man, who originated under the regular diurnal rhythm of the Tropics. The inference is that for health a siesta or break after lunch is more natural. As Winston Churchill in his autobiography puts it: "The rest and the spell of sleep in the middle of the day refresh the human frame far more than a long night. We are not made by nature to work, or even to play, from eight o'clock in the morning till midnight. For every purpose of business or pleasure, we ought to break our days and our marches into two."

[1] *Über die Rhythmik der Leberfunktion des Stoffwechsels und des Schlafes.* By Erik Forsgren. Goteborg: N. J. Gumperts Bokhandel. (Swedish kr. 6.50.)

MONKEY MALARIA IN G.P.I.

In the current issue of the *Journal* (p. 662) Drs. van Rooyen and Pile—the former working as Halley Stewart Research Fellow at the University of Edinburgh, and the latter as senior assistant medical officer, Midlothian and Peebles Asylum—contribute a paper on the use of *P. knowlesi*, a plasmodial parasite of monkeys, in malaria therapy. Up to a few years ago the plasmodial parasites of monkeys were but little known and imperfectly understood, and were the preoccupation only of the systematic protozoologist. The position was, however, entirely altered by the discovery of Knowles and Das Gupta that inoculation

of *Silenus* (*Macacus*) *rhesus*, the common Indian monkey, with the natural and relatively harmless parasite of another species of monkey, *S. irus*, resulted in such heavy parasitic infections as had rarely before been seen in any plasmodial infections of animals or even of man. Hitherto research upon malaria in many directions had been greatly hampered by the lack of any suitable experimental animal. In monkey malaria there now appeared to be made available a new type of material in which almost everything that could be desired for research in the laboratory was abundantly provided. Investigations by Sinton and Mulligan in India rapidly brought order into the vexed question of the somewhat numerous species of malaria parasites occurring in monkeys, and showed what a rich field for experimental work on immunity, serology, and in other directions had been opened up.

In particular one species of parasite was so readily transmitted and maintained that it has since been the subject of a great deal of research by these authors and others. It soon became evident that the parasite was: (*a*) much closer to human malaria than any previous type of animal material used—for example, bird malaria—indeed, was so close as to be transmissible to man himself ; (*b*) extraordinarily standardized in its progress and clinical manifestations and invariably fatal if untreated, thus making it very valuable in testing the curative effect of any experimentally administered drug ; (*c*) readily controlled by quinine and still more so by atebrin, thus being suitable for therapeutic researches as to the mode of action of these drugs ; (*d*) characterized by such massive infections that for the first time it has become possible readily to isolate parasite substance in mass and study the physico-chemical properties of the parasitic protoplasm ; and (*e*) a parasite giving rise to many of the characteristic features of human malaria, such as recurrences and a progressive and marked immunity. With so many advantages as laboratory material it is interesting now to see that it may possibly be put to another useful purpose.

The parasite used by the two authors in their therapeutic trials was a strain of *P. knowlesi* isolated at the headquarters of the Malaria Survey of India, Kasauli, from a specimen of *Pithecus pileatus* Blyth purchased in Calcutta. Through the courtesy of Colonel J. A. Sinton, director of the Malaria Survey, and of Major G. Covell, I.M.S., who himself brought an infected monkey to England, this strain was, some two years ago, successfully established at the London School of Hygiene and Tropical Medicine, where it has since been regularly maintained for research purposes in passage through monkeys. As the material was greatly in request it has been further transmitted by blood sent through the post to a number of centres in Europe and to America (New York), the maximum period successfully withstood under such conditions being twelve days (in the last-mentioned case). Experiments carried out prior to those now recorded—by Colonel S. P. James and Dr. W. D. Nicol at the Malaria Therapy Centre at Horton Mental Asylum, Epsom—had some time ago confirmed the fact, first noted in three cases by Knowles and Das Gupta, of transmissibility to the human subject, and a certain number of cases had been studied with reference to the value of this parasite in the treatment of general paralysis. The results by van Rooyen and Pile appear to show that it may be effective in this respect, and may, in certain circumstances, have a considerable practical convenience. The cases described, next to the three originally given by Knowles and Das Gupta, may be regarded as a clinical description of a new, if artificially acquired, type of human malaria. Such infections in man may be quite severe, especially following direct inoculation from the monkey. Passage in the human being, however, appears to cause an attenuation of virulence both for man and for monkey, contrasting with passage from monkey to monkey, the strain at the London School of Hygiene and Tropical Medicine being still as virulent and standardized as when first introduced.

The advantages of this form of treatment from a practical point of view have been pointed out by the authors. One outstanding advantage is the readiness with which material may be kept in the laboratory until required. By suitable treatment a monkey may be kept infective for six months or more, since even after apparent complete recovery the blood is still capable of infecting a fresh animal. On the other hand, it has still to be shown conclusively that such treatment is as effective as that with the more usual strains of human malaria. One advantage which treatment with monkey malaria might have offered—namely, its use in cases which through inoculation with human malaria strains have become immune to these—is much discounted by the fact that apparently these cases are also difficult to infect with the animal strain. The authors' results with atebrin are somewhat unexpected, since in the monkey this drug has an almost miraculous curative effect ; nor have the cases at Horton exhibited any such resistance to the action of this drug as is recorded by the authors. Further experience with monkey malaria in this connexion must in any case have a considerable interest and importance.

PROPHYLAXIS OF DIPHTHERIA

In the correspondence columns of this week's issue Dr. R. T. Bowden poses a problem with which many medical men must be confronted in their daily work—how to answer questions put to them by inteligent laymen on what are, for the latter at any rate, controversial matters. The first question is, in its essence, Why is preventive inoculation advocated for diphtheria when for this disease such a potent remedy as antitoxin exists? The layman needs, perhaps, a fuller answer than the obvious one that prevention is better than cure, although he can hardly gainsay this. Prevention is not only better but cheaper, an argument which may appeal more to the layman than

it does to us. In this connexion the figures quoted by Dr. J. Graham Forbes[1] are apposite: "During the year 1921 the cost of diphtheria alone to London ratepayers has been estimated at about £500,000; and the cost of every case of diphtheria at about £30, a sum which would cover the cost of protecting 200 children." One must also take into account the loss of time from school and work and the disorganization of the home in which infection has occurred. Again, it cannot be said that the administration of antitoxin is altogether devoid of danger: there is the slight, but not negligible, risk attendant upon the administration of any foreign protein in large volume, especially if it has to be given by the intravenous route in grave cases. Antitoxin, if promptly applied, is a very potent remedy against diphtheria, but unavoidable circumstances prevent it from being a certain cure. In practice, parents seldom summon medical aid with sufficient promptitude, because the onset of the disease is so like that of many minor ailments from which children quickly recover without treatment. Unfortunately, also, practitioners sometimes fail to make a rapid diagnosis: it is commonly said in public health and hospital circles that the delay caused by waiting for bacteriological confirmation is a cause of many fatalities. Further, the success of antitoxin treatment varies with the virulence of the infection, so that it may be unavailing in fulminant cases by the time such cases come under treatment, the above practical difficulties being kept in mind. In the nature of human affairs it seems unlikely that earlier diagnosis and treatment will be easy to attain, and on these grounds alone it would appear better to advise parents to attack the disease by prophylactic measures, which can be carried out at leisure, than to wait for a form of treatment which requires almost perfect co-operation between parents, practitioner, and the health organization if its benefits are to be fully realized. The second question asked by Dr. Bowden opens up epidemiological considerations of some magnitude. Crude comparisons of the apparently similar trends of death rates from different diseases may conceal very real differences. For instance, the decline of mortality from scarlet fever began about 1870, and was extremely rapid until the end of the century, since when it has been rather slower—naturally, since it had already reached such a low level. This decline has been due, so far as we know, to a fall in fatality rather than in prevalence. On the other hand, the death rate from diphtheria, which might have been expected to follow the same course because of the similarity of the mode of transmission, remained practically at a constant level until 1900, and then started to fall—that is, when antitoxin began to be widely used. The association, of course, cannot be proved to be that of cause and effect, but clinicians who have treated the disease with and without antitoxin have no doubt of its efficacy in reducing hospital fatality rates, and it is reasonable to apply such observations to the interpretation of the decline in the national death rate. This decline is all the more striking when it is remembered that it has occurred in many towns where the incidence of the disease has actually increased very greatly. Comparison with measles and whooping-cough is even more difficult. For one thing the age incidence of these diseases is different from that of diphtheria, and we have no knowledge as to their case rates and fatality rates throughout the country. Nevertheless, there would seem to have been a great fall in their fatality rates at all ages. In this connexion it must be remembered that the most important single cause of death in measles and whooping-cough is pneumonia, a complication for which simple nursing may do so much more than it can for the toxic, nervous, and cardiac manifestations of diphtheria. The intelligent layman, if he is really unprejudiced, can readily appreciate that measures which apply to one disease are not necessarily applicable to another, and that the march of medicine depends upon specific attention to each disease as well as upon the general social and environmental conditions which will promote the general health.

[1] Medical Research Council. Special Report Series, No. 115. 1927.

TUBERCULOSIS IN BIRMINGHAM

The recently published annual report of the Tuberculosis Section of the Birmingham Public Health Department shows a substantial reduction of the death rate for all forms of tuberculosis when compared with previous years. The rate for the past year—namely, 0.8 per 1,000—was the lowest yet recorded, and is similar to that prevailing in Sheffield, Edinburgh, and Bradford for the same period. The number of contacts and suspects examined also reached the highest number yet recorded. Among 698 young children from 1 to 4 years examined as contacts, 375 came from homes where some member of the household presented a positive sputum, and of these 2.6 per cent. were found to be suffering from tuberculosis. Of the remaining 323 children who were contacts to patients with a negative sputum only 0.6 per cent. were found to be suffering from tuberculosis. Children from 5 to 15 years of age who were in contact with patients whose sputum contained tubercle bacilli were found to be suffering from tuberculosis to the extent of 11.9 per cent. Contacts to patients with a negative sputum of similar age were found to be tuberculous in only 4.2 per cent. Apparently a good deal of care is given to the examination of these contacts, and the dispensary has thirty-six beds reserved in one of the suburban sanatoria for the investigation of patients. Child contacts at the dispensary are examined physically and by *x* rays, and those under 10 years of age are submitted to an intradermal tuberculin test; if sputum can be obtained it is examined, and in a number of instances faeces are also investigated for acid-fast and alcohol-fast bacilli. Children entering the sanatorium for observation purposes, if under 10 years of age, have the gastric contents examined for acid-fast bacilli, and if over 10 years have a blood sedimentation test undertaken, in addition. The report also shows that a number of beds are provided for the advanced hospital type of patient that is unable to work, infective, and imperfectly isolated at home. These patients are encouraged by every possible means to remain in the hospital sanatorium for long periods; in fact, many of them remain until death occurs. During the year there were 814 deaths in the city from all forms of tuberculosis, and of this number no fewer than 354, or 43 per cent., occurred in sanatorium and hospital beds controlled by

the Public Health Committee, which is a prophylactic measure of some importance. About 6,000 screen examinations, apart from films, were undertaken in the *x*-ray investigation of patients at the dispensary, and about 5,000 specimens of sputum were examined at the dispensary alone, apart from those dealt with by the municipal laboratory.

HEALTH AND THE LEAGUE ASSEMBLY

In the last hurried and overshadowed days of its session (writes our Geneva Correspondent) the League of Nations Assembly passed the resolution on nutrition in relation to public health to which reference was made in the *Journal* of September 28th (p. 588). In this resolution, which was brought forward by Earl De La Warr, the Assembly asked the Council to continue and extend the work of the Health Organization in this field, to instruct the technical organizations of the League to collect, summarize, and publish information on the measures taken in all countries to combat malnutrition, and to appoint a committee of experts to make a general report on the whole question from its health and economic aspects. Lord De La Warr pointed out that the present increased production gave to Governments the opportunity of taking another step forward towards building a healthier race. To move in the comparatively new field of nutrition was not only beneficial to public health, but also the most immediately practical way of dealing with the problem of agricultural surpluses and the depression of prices which had resulted therefrom. He added that the proposed inquiry would be undertaken in collaboration with other international organizations—notably the International Labour Office and the International Institute of Agriculture at Rome. The Spanish delegate asked that the inquiry might go further and examine international economic relations, but the French, Australian, and other delegates took the view that it would be dangerous to extend a scientific committee into this field, and their view prevailed. The Assembly proposes to remodel the Health Organization of the League. The Organization is a very complex affair, because it requires to be adjusted to and co-ordinated with the Office International d'Hygiène Publique in Paris. The Health Committee has grown so much that, although not adequate to serve the purpose of a general conference, it is too large and unwieldy to act as a consultative committee to the League Council in regard to health matters. It was proposed to reconstitute the committee so that it would comprise, in a membership of about ten persons, the varying national and technical experience required to enable it to be an effective consultative body. Objection to this course, however, was voiced by the British and French and other delegations, and another proposal found more favour, that the present executive subcommittee of the Health Committee be enlarged so as to consist of the presidents of the Health Committee and of the Office International d'Hygiène Publique and eight members, including nationals of the powers having a permanent seat on the Council (at present the United Kingdom, France, Italy, and Soviet Russia), this body to function with full powers in the intervals between the annual sessions of the principal committee. In bringing before the Assembly on the last day of its meeting the question of opium and other dangerous drugs, M. François of the Netherlands, the rapporteur, said that a very harmonious atmosphere had prevailed throughout the debates of the Fifth Committee on this subject, and there had been no differences of opinion on major questions. With regard to clandestine manufacture, the Canadian delegate mentioned that in the Far East a rapid increase had taken place in the clandestine manufacture of heroin, and this was a serious menace to the North American continent, which ran the risk of an invasion of narcotic drugs. The United Kingdom delegate, Miss Horsbrugh, M.P., drew attention to a practical suggestion made by the Shanghai municipal council that restrictions should be placed on the importation of caffeine and acid acetic anhydride, both of which chemicals had been found to be used in large quantities in clandestine manufacture. The delegate of Poland stressed the importance of national laws being based upon a uniform principle in the matter of penalties for illicit traffickers. The new Polish criminal code ranges illicit drug traffic among the *delicta juris gentium*, such acts being punishable irrespective of the nationality of the offender, of the place where the offence was committed, and of whether in that place the act was regarded as an offence or not.

BIBLIOGRAPHY OF "SYPHILIS"

Dr. Fulton's excellent bibliography of Fracastoro's poem on Syphilis[1] shows that Osler "being dead yet speaketh." The school of humanistic medical history which he founded goes from strength to strength both in England and in the United States. The mind's eye sees him with an arm cast round his two pupils, Drs. Fulton and Klebs, who take part in this bibliography, walking up and down in his garden at Oxford, discussing lovingly the memory of Fracastoro, of whom he thought so highly. Would that he could actually have done so! Dr. Klebs—himself an expert bibliographer—writes a charming introduction. Dr. Fulton and Leona Baumgartner describe the various editions of the poem. They classify them into Latin editions, including the Opera Omnia, Latin translations, English translations, French translations, German translations, and "other translations," with an appendix dealing with the various biographies and criticisms. Interest in the poem seems to have been gradual and intermittent. The Italian translations began in 1585, the English in 1686, the French in 1753, but the German not until 1827. No Spanish translation appeared until 1863, nor a Portuguese until 1883. The interest, too, for some reason not yet explained was spasmodic. Five separate Italian translations appeared between 1731 and 1739; four English translations have been published during the last five years. The labour of compiling the present bibliography must have been very great; the result is worth the trouble. The authors give an account of one hundred items, each of which they have either seen personally or have received information about at first hand.

[1] *A Bibliography of the Poem "Syphilis Sive Morbus Gallicus" by Girolamo Fracastoro of Verona.* By Leona Baumgartner and John F. Fulton. New Haven: Yale University Press. London: Humphrey Milford: Oxford University Press. (22s. 6d.)

THE TRAFFIC IN DANGEROUS DRUGS

The British Government's Report to the League of Nations for the year 1934,[1] furnished with fourteen statistical tables, fully complies with the requirements of the Hague and Geneva International Conventions on Dangerous Drugs. The Permanent Central Opium Board, recently in session at Geneva, is fully informed of the effect given, in this country, to the control of traffic in dangerous narcotics, as is not always the case with some of the countries party to the Opium Conventions, especially those in South and Central America. The report repeats the assurance that "addiction to narcotic drugs is not prevalent in the United Kingdom," and recalls the fact that "opium, coca plant, and Indian hemp are not cultivated in this country." While no new laws, orders, or regulations have been issued for the municipal control of the traffic, a branch of the Home Office has been "created for the purpose of dealing with all matters relating to dangerous drugs." Due regard has been paid to the Limitation Convention of 1931: "all licensed wholesale druggists, including manufacturers, are required to render annual returns of their transactions in dangerous drugs. From these returns the annual figures of home consumption are calculated, and these figures are the basis of the estimates furnished to the Supervisory Body" at Geneva, set up under the Convention of 1931. During the year 1934, 53,422 lb. of raw opium were imported, mostly of Turkish origin. The exports of morphine amounted to 14,317 ounces, of heroin 2,099 ounces, and of cocaine 5,996 ounces. In the case of the first-named there was an increase, in the case of the other two a decrease, on the amounts for the previous year. Some twenty-six seizures of drugs illicitly imported occurred; in fourteen cases prepared (or smoking) opium was discovered and confiscated. The possession of prepared opium, which is still exported from India, is totally prohibited in this country. The other seizures were raw opium, Indian hemp, morphine, and cocaine. Eighty-six persons were proceeded against, and sixty-nine were convicted; twenty-eight were sentenced to imprisonment, two to penal servitude for three years. It is claimed that, unlike some other countries, illicit traffic as it exists here is "unorganized and only on a very small scale."

HEALTH INSURANCE IN NEW ZEALAND

In a Supplement to the *New Zealand Medical Journal* of August last an account is given of the steps which are being taken to conduct an inquiry into the desirability of introducing some system of national health insurance into that Dominion and as to the form which such system, if established, should take. It appears that a draft scheme has been prepared for discussion by the Hospital Boards Association, and that now the Divisions of the British Medical Association are being asked to consider the whole subject. The first discovery that has been made seems to be that the circumstances of medical practice in New Zealand have not been such as to interest practitioners there in questions of national health insurance, and that the main need is for investigation and for the dissemination of information on the matter. For this purpose a special committee has been set up by the Council of the New Zealand Branch of the Association, and its method of procedure is somewhat unusual. "In questions affecting the profession as a whole," it says, "the practice has been to submit propositions from the central body to the Divisions for discussion. This is equivalent to setting up an 'Aunt Sally,' but it tends to demolition and disunion rather than to construction and evolution of common purpose, to criticism more than co-operation." In the hope, therefore, of arriving at constructive suggestion rather than destructive criticism, four co-ordinating centres of associated Divisions have been set up, and each is asked to devote itself to a specified aspect of the subject—the relation of a scheme to friendly societies; the relation to hospitals; the control of medical practice; finance, and administration and certification. In addition there is a Central Educational Committee which is to "formulate plans for the distribution of educational literature to the profession." At a later stage there will be conferences with friendly societies and with hospital boards, but, as is pointed out, "none of these steps can be productive until the Association has mastered the subject for itself." The two chief documents so far circulated appear to be the Canadian Medical Association's "Plan for Health Insurance in Canada," and the British Medical Association's "Proposals for a General Medical Service for the Nation," but the available literature on the subject is, of course, enormous, and certain other publications are mentioned in the *New Zealand Medical Journal* Supplement. It is by no means certain that these will be found the most suitable for the particular purpose in view, and it may not be inappropriate to remind practitioners in the Dominion, most of whom are members of the B.M.A., of recent articles in the *British Medical Journal* which, together with other references alluded to therein, may be found to contain facts, observations, and criticisms of value. To take only the last eighteen months, such articles will be found in our issues of April 7th, 1934 (p. 626), June 9th, 1934 (p. 1036), September 22nd, 1934 (p. 559), October 27th, 1934 (p. 775), and February 23rd, 1935 (p. 365).

[1] The Traffic in Opium and Other Dangerous Drugs. Report to the League of Nations by His Majesty's Government, 1934.

A CHRISTMAS APPEAL

The Royal Medical Benevolent Fund is approaching its centenary, and its revered president, who has lived through ninety of the ninety-nine years, now writes again to ask for the continued support and sympathy of the profession for the good work done by this charity. The immediate object of his letter is to make an appeal on behalf of one particular part of the activities of the R.M.B.F.—namely, the distribution of a Christmas gift of 30s. to each of the beneficiaries on its books. The number of these is usually between six and seven hundred. They are infirm or invalid doctors, or the widows or daughters of deceased medical men, whose incomes are not even £100 a year. The gift that Sir Thomas Barlow asks our readers to contribute towards will provide a little additional warmth or clothing for many who dread the winter months, or brighten a poverty-stricken home with some small pleasure. Donations should be sent to the treasurer of the Fund, 11, Chandos Street, Cavendish Square, W.1.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some lesions of the nervous system met with in general practice.

THE TREATMENT OF HEAD INJURIES

BY

C. P. SYMONDS, M.D., F.R.C.P.

AND

GEOFFREY JEFFERSON, M.S., F.R.C.S.

Of the parts included within the head the brain is anatomically the largest and functionally the most important. Fracture of the skull is of little import except in so far as it may cause haemorrhage of a kind that may compress the brain, or open pathways through which the meninges or the brain itself may become infected. It is true that the presence of fracture offers proof of a degree of violence which must almost always have caused direct injury to the brain, but it is also true that the brain may be severely damaged in a case of head injury without fracture of the skull.

The most important part of the treatment of head injuries, therefore, is that which concerns direct injury of the brain. The commonest immediate effect of such an injury is the loss of consciousness, which by tradition is accepted as the result of concussion—a term which provides a convenient cloak for our ignorance of the underlying pathology. A patient may recover from concussion, even though the state of traumatic stupor may persist for several days without other evidence of cerebral injury. On the other hand, a patient who has escaped concussion may present other and more lasting symptoms of damage to the brain. From the practical point of view, however, the most convenient approach to the treatment of head injuries is by way of a division of the cases according to the presence and duration of concussion after the accident.

I. PATIENT UNCONSCIOUS WHEN FIRST SEEN

We shall begin, therefore, by considering the case of a patient who is unconscious when first seen by the doctor, and who is reported to have been so since the moment of the accident. Before the patient is moved a few essential observations should be made.

1. Is there any dangerous degree of bleeding from the scalp? If so, this should be controlled, so far as possible, by a pad and firm bandage, but nothing stops bleeding completely save suture, and this will not be possible or even desirable as a first-aid measure. It is a mistake to suture up a scalp wound properly until conditions are favourable for a full exploration of its depths.

2. Is the patient collapsed—that is, pallid, with rapid, thready pulse? If so, measures should at once be taken to procure warmth.

3. Are there other gross injuries, such as fractures of the limbs, neck, or spine, which may be masked by the state of unconsciousness and which may demand first-aid treatment?

4. What is the depth of unconsciousness? This question is not simply answered. The following tests provide a rough measure of the degree of stupor from least to greatest severity: (*a*) Can the patient be roused to respond to a simple question forcibly put, such as, "How are you?" or "What is your name?" (*b*) Does he respond to a forcible command, such as "Put out your tongue," "Give me your hand"? (*c*) Does he respond by appropriate movement to a painful stimulus—for example, does he withdraw his arm or leg when the skin is pinched? (*d*) Is the corneal reflex present?

A note should also be made of the size, and especially the relative size, of the pupils, and of the presence or absence of any difference between the power and tone of the muscles of the face and limbs on the two sides of the body.

The Scalp Wound

Whenever feasible the patient should be moved into a nursing home or hospital, and, if possible, *x*-ray photographs of the skull should be taken on admission, except in the case of a patient who is severely collapsed.

At this stage certain surgical problems may present themselves. Unquestionably the most effective method of arresting haemorrhage from the scalp is by deep suture. Sometimes the quantity of blood lost from a scalp wound is prodigious. Bazett, working on the blood volume of severe injuries, estimated that the loss from a scalp wound might amount to as much as one-fifth of the total volume. Clearly judgement must be exercised in the treatment of severely exsanguinated patients with dirt-ingrained wounds. These require excision of their edge, but it would be a great mistake to take this step immediately without regard to the state of exhaemic shock present. The best plan would be to insert such sutures as are necessary to arrest the bleeding, and to leave the débridement of the wound aside for a sufficient number of hours to allow of recuperation. Scalp wounds of great size are not very common; they result most often from glass cuts in motor accidents.

It is the rule to inspect the floor of a scalp wound for evidence of fracture. If there is a linear crack it should not be interfered with. If there is a depression the treatment will be that of a compound fracture (see below). If a fracture line is seen it is worth while to note its direction. Does it seem likely to cross the path of the middle meningeal vessels? If so, we should be more than ever on the watch for an epidural haemorrhage. The operator should always confirm his impression of the fracture by studying the *x*-ray films, but these are often not available at the time when the scalp wound is first attended to. Scalp wounds are always the better for drainage with a narrow strip of rubber.

Depressed Fracture

If a depressed fracture is present, should it be operated upon? Always, if there is a scalp wound over it, for infection of the bone that may spread deeply is a real danger, and, moreover, operation should be performed within as few hours as is judged wise having regard to shock and loss of blood. A very limited bone removal is advised, after removing a small disk at the edge of the depression. The object of the operation is not so much the elevation of the depression as the extirpation of infected bone and the provision of external drainage. If the scalp over the depression is intact there is no need generally to intervene unless the *x*-ray films show an in-driven bone fragment, such as may have penetrated the dura. If that has happened an operation should be undertaken within forty-eight hours.

We believe that a shallow depression does little permanent harm, and that epilepsy is no more likely to

develop in such a case than after a general cerebral contusion. The most potent cause of epilepsy is local laceration of the cortex ; hence the importance of determining by *x*-ray examination whether the bone has been driven deep enough or angularly enough to have caused severe local injury. This implies that late operations on pond depressed fractures will very rarely be done.

General Treatment

On admission to hospital the patient should be laid flat in bed with his head to one side. A more thorough examination should then be made: this will include the points already mentioned, together with a record of the pulse, temperature, and respiration ; examination for thoracic or visceral injury ; and, a note of the tendon jerks, abdominal reflexes, and plantar responses.

From this time onwards the nurse should keep a record at regular intervals not only of the pulse rate but of the depth of unconsciousness as indicated by the tests already mentioned, of any difference between the tone and power on the two sides of the body, and of the relative size of the pupils. During the first forty-eight hours this record should be two-hourly, and should thereafter be continued at a four-hourly interval until consciousness has been regained. During the early stage of this period sedatives should be avoided if possible. Fluids should be given by spoon or feeding-cup. A watch should be kept on the bladder and the need for catheterization.

Danger Signals

The nurse should be instructed to call the doctor in case of any of the following developments: progressive deepening of unconsciousness ; progressive loss of tone or power on one side of the body ; progressive slowing of the pulse ; and progressive discrepancy in the size of the pupils. In such cases the questions which the doctor is called upon to decide are whether there is sufficient evidence of progressive meningeal haemorrhage to warrant exploratory craniotomy, and, if so, whether he should attempt the operation himself or call to his aid a surgeon with particular experience of cerebral surgery.

With regard to the first question, there are certain preliminary considerations to be weighed. Progressive deterioration of the patient's condition in the early stages after a severe injury is not necessarily an indication for surgical intervention. There is a large group of cases in which from the outset the depth of unconsciousness is profound—no response to painful stimulation ; often absence of corneal reflex—the pulse remains feeble whether it be slow or rapid ; the temperature is either persistently subnormal or shows a precipitate rise ; and the patient usually dies within the first forty-eight hours without the development of any localizing signs.

The cause of death in these patients is laceration of the brain. No operation can save them, and such chance that they may have is better if they are left alone. The point which is of greatest value as evidence of compression from meningeal haemorrhage is an increasing depth of unconsciousness. It must, however, be recognized that in a certain limited degree this may occur in a state of concussion without compression. It is not uncommon to find a patient who for the first hour or two after the injury is able to answer questions in a dazed fashion, but subsequently becomes unresponsive to this test and even to simple commands, though he will exhibit spontaneous restless movements and will react to painful stimulation ; and in this state he may remain for several days. It is, then, the degree of unconsciousness in relation to its initial depth that has to be taken into account, with especial emphasis upon a depth which is steadily progressive, and loss of the response to painful stimulation. A hemiparesis which is undoubtedly progressive is a clear indication for operation. Progressive slowing of the pulse rate is of value when taken together with the other indications. In a patient who shows no progression in the depth of unconsciousness or other danger signs a slowing pulse rate is not necessarily of importance.

The delayed appearance of a dilated pupil, though it may sometimes be due to intrapontine oedema, is always suggestive of a meningeal haemorrhage, usually on the side of the abnormal pupil. In case of doubt it is better to explore, and it is to be remembered that acute subdural haemorrhage is as common a cause of compression as the better-known epidural haemorrhage from the middle meningeal artery, and that the former not infrequently occurs in the absence of a fracture. The exploratory operation, therefore, is not complete until the dura has been opened. Whether the general practitioner will attempt the operation will naturally depend upon local and personal considerations which are outside the scope of this article. If the progress of symptoms is rapid from hour to hour time is of the first importance, but when the development is measurable in terms of days there is usually opportunity for a carefully planned operation, and there is much to be gained from the service of a surgeon accustomed to the modern technique of cerebral surgery.

Technique of Emergency Operation

If an emergency operation is to be undertaken it is best done under local anaesthesia—30 c.cm. of novocain (1 per cent.) and adrenaline. Through a vertical incision 3½ to 4 inches long in the temporal fossa, 1 inch in front of the ear, an opening is made in the temporal bone after splitting the muscle. When an epidural haemorrhage is present the dark clot is at once seen. The bone opening is enlarged and the clot removed as far as possible. There is no very great difficulty so far, but the securing of the actual bleeding may be no easy matter, and gauze may have to be used as a pack. This, of course, is undesirable, for its volume might well equal that of the clot removed, and every effort must be made to underrun the meningeal artery with an occlusive suture. There is no doubt that this operation is a much more difficult one than is commonly supposed, and when the bleeding comes, as it may, from an inaccessible spot, the only good way to arrest it is by plugging the foramen spinosum with a shaped piece of matchstick. But in case of dire emergency, and this can arise, the practitioner must operate and make the best of it.

If no epidural clot is present a very dark tinge will suggest a subdural haematoma. A very small dural incision will suffice to show whether a subdural haematoma is present or not. Attempts at intradural exploration are not recommended through the limited approach outlined above. A small flap allows a much better approach, but it requires considerable experience and dexterity in the making if the patient's chances of recovery are not to be jeopardized.

The clot of a subdural haematoma has long been known to be curiously fluid, a state which we now believe to be due to the osmotic passage of cerebro-spinal fluid through the thin endothelial covering that so rapidly surrounds an intradural blood clot. This fluidity allows of the easy extraction of the contents of such a clot, so that it could be dealt with through a small opening if this happened to lie over it. But a small osteoplastic flap, made again under local anaesthesia, allows of better exposure. Large flaps are not advisable in traumatic cases, in any event.

Continuation of General Treatment

The administration of sedatives should be postponed so far as possible until it is clear that the depth of stupor is diminishing, and they should be given s.o.s. to control a harmful degree of restlessness. In certain cases restlessness may be present from the first, and in these sedatives will be needed:

℞ Chloral hydrate ... ... gr. xx
Pot. brom. ... ... gr. xx
Aq. chlorof. ... ... ad ʒ ss

This mixture should be taken in two ounces of water up to four-hourly if required. Morphine should be avoided as far as possible, but is often necessary. If a patient is sufficiently restless and vigorous to require it, it will do him no harm. Its disadvantage is that it masks the possible development of progressive stupor. Small doses—1/6 grain to 1/4 grain—should be given and repeated when indicated, the patient being allowed to recover from the effect of each dose sufficiently for an assessment of his mental state before another dose is taken. Hyoscine hydrobromide 1/200 grain to 1/150 grain may be combined with the morphine if necessary for extreme restlessness, but should be avoided, if possible, owing to its toxic effects. For the patient who is noisy and unmanageable at night paraldehyde, 3 to 4 drachms in a wineglass of orange-juice and water, is an effective hypnotic, and may be followed by one or more doses of the chloral and bromide mixture. When the need for hand feeding is past, the patient may have whatever food he can take. Alcohol should be forbidden.

Control of Intracranial Pressure

At the end of thirty-six hours, if the patient has recovered from shock but is still unconscious, lumbar puncture should be performed. The pressure of the fluid should be estimated by manometer, and if it is above 120 mm. of water, fluid should be run off until this level is reached. If the pressure is above 200 mm. of water, such of the following measures as may be practicable should be employed for the diminution of intracranial volume and pressure.

The patient should be propped up in bed in the Fowler position. A solution of magnesium sulphate, 3 ounces in 6 ounces of water, should be administered per rectum. The solution should be warmed and run in slowly through a tube and funnel, and has to be retained for half an hour for a successful result. Or 2 drachms of magnesium sulphate in 2 ounces of water may be taken by the mouth, and thereafter 1 drachm of magnesium sulphate in the same amount of water hourly until a watery stool is obtained. Lumbar puncture should be repeated daily if the pressure is over 300, and at less frequent intervals when the pressure is lower, with drainage to a normal level as already described. If at the first lumbar puncture the pressure is normal these methods of treatment will not be required, and as the patient becomes more conscious he should be encouraged to rest in whatever position he finds most comfortable.

It is difficult to lay down a definite rule about the use of intravenous hypertonic solutions (the best being 50 per cent. glucose). There is no doubt about the potency of this method of therapy; therein lies its danger. Certainly it should never be used during the first hours after injury. In those cases in which more than two lumbar puncture readings have shown the pressure to be above 200 mm., the injection of hypertonic solutions is allowable, but one must be reasonably sure that no large local clot is present. In most cases intravenous hypertonics are best unused.

After Recovery of Consciousness

As soon as the patient regains consciousness in the sense of being perfectly and continuously aware of his surroundings, a new phase of treatment is begun in which subjective symptoms guide the degree and duration of cerebral rest required. The symptoms to be looked for are: headache; difficulty in concentration; mental fatigue; insomnia; and giddiness on movement. So long as any of these symptoms are present the policy of strict rest should be continued, and this should be reinforced by medinal 5 to 10 grains, s.o.s., nocte, and a mixture such as:

℞ Pot. brom. ... ... gr. xx
Liq. arsenical. ... ... ♏ ij
Aq. chlorof. ... ... ad ʒ ss
ʒ ss, t.d.s., p.c.

For the headache the patient should be encouraged to find the posture of greatest ease, and, if necessary, should be propped up. Lumbar puncture should be reserved for severe headache, and the manometer should be employed as a guide to the further need for withdrawal of fluid and dehydration by means of salts as already described. One or two tablets of empirin should be prescribed at need, or, if the headache is exceptionally severe, a powder containing 5 grains each of aspirin and pyramidon and 1/6 grain of heroin hydrochloride. Giddiness on movement may be relieved to some extent by 1/2 grain of luminal, t.d.s., p.c.

The proper management of the patient at this stage is of great importance, and often beset with practical difficulties. In the detailed instructions which follow we shall be precise in order that we may be clear, with full recognition of the need that may arise of modification according to circumstance.

Graduated Convalescence

Under nursing home conditions the patient should be nursed in bed, should be read to rather than allowed to read, and should be permitted not more than one visitor, who should remain with him for short periods only. The room should be darkened for part of the day. Boredom, however, may induce a degree of restlessness which is itself harmful, and allowance must be made for this factor in handling the individual patient. The continued presence of a quiet-minded and influential relative or friend in the room may be of help in some cases. When under such conditions the patient has been free from symptoms for forty-eight hours, or if after complete recovery of consciousness he has at the end of three days admitted to no complaints, a plan of graduated progress towards greater cerebral activity should be begun as follows.

The patient may have some mental exercise for an hour in the morning—such as listening to the gramophone or wireless, working at a jigsaw or crossword puzzle, or playing a game of cards. In the afternoon he may sit up in a chair for an hour. If under these conditions there is recurrence or development of symptoms the conditions of strict rest must be reimposed. If, on the other hand, the first step towards greater activity is successful, at the end of forty-eight hours he may take the next. He may be allowed up to bath and lavatory, may read at will, and may have a few visitors, though not more than one at a time.

If he again remains symptom-free, at the end of another forty-eight hours he may dress and sit up in his room, and may have more than one visitor at a time. If he remains well after another forty-eight hours he may begin coming down for meals, go out for a daily short walk or drive, and lead a quiet life in the household.

If, after the same interval, he remains well, walking exercise should be increased, and he may be allowed a normal life at home. If at the end of another forty-eight hours he is free from symptoms he should have fourteen days' holiday, proceeding gradually to a fully active existence, before he returns to work. Recurrence or development of symptoms *at any stage* should be the signal for a backward step to the point at which the patient was symptom-free.

This plan of graduated convalescence may be applied as well to patients who have been long unconscious—for instance for ten days—as to those in whom the duration has been brief—for instance, ten hours. In practice it will be found that as a rule a long duration of unconsciousness is attended by more severe and prolonged after-symptoms, but it is a rule to which there are striking exceptions.

Under hospital conditions neither the initial quiet nor the smooth progress towards greater activity is so easily obtained. The same graduated stages should be observed. In the earlier stages the patient's bed should be screened, and should be in the quietest part of the ward. It is better that he should have his visitor at some time removed from the bustle and noise of a visiting day. On first getting up he should sit apart from the other patients in a quiet corner of the ward or balcony. The transition from the relatively peaceful surroundings of the hospital to those of the home is often too abrupt, and leads to recurrence of symptoms in a patient who is thought on his discharge to have recovered. He should therefore be kept in hospital until he has been able to lead an ambulant existence both indoors and out for three or four days without symptoms, and should then usually be transferred direct to a convalescent home.

Return to Work

According to the plan outlined it will be possible at the optimum for a patient to return to his work in three or four weeks from the time he recovers consciousness. On the other hand, the graduated progress may have to be spread over a period of several weeks or months. In any case in which the duration of unconsciousness has been longer than forty-eight hours the patient should be advised to take 10 grains of potassium bromide at night for the ensuing two years as a precaution against epilepsy.

This plan of early return to work may strike some readers as revolutionary, but the plain fact is that symptoms must be our guide. Where there are none, the above programme may be safely followed out ; there is nothing to be gained by prolonging an unwanted convalescence. An extended rest would not matter if it were not for the fear of a neurosis developing, but there is this danger, and too solicitous an attitude may do harm. On the other hand, we must give sympathetic attention and credence to such complaints as may continue to give trouble ; and where there are complaints we must alter our plans to deal with them. In particular, we should recognize that an undue liability to fatigue (both mental and physical), insomnia, and difficulty in concentration are common residual symptoms of organic damage, and must not lightly be dismissed as neurotic. The kind of work to which the patient must return has also to be taken into account, and in relation to this we would emphasize the importance of testing the patient, as far as possible, to his full capacity before declaring him finally recovered—whether by means of mental or of manual labour.

Finally, the point we would stress is that the date of return to work should be determined for each individual by analysis of the symptoms in his particular case. It is not everyone who will be well enough to begin work in three or four weeks after a severe head injury ; sometimes it will be three or four months, especially in the case of middle-aged or elderly persons, but a really prolonged period such as a year or more is very rarely required, except by patients with symptoms of focal injury—for instance, aphasia.

II. REPORTED TO HAVE BEEN UNCONSCIOUS

The period of unconsciousness in the case of a patient who is conscious when first seen but is reported to have been unconscious will usually have been less than an hour. In such an event it is important that the degree of mental alertness should be estimated at once, and that it should be estimated again after the patient has been put to bed, when a rough neurological examination should be made, as described in Section I.

The period of strict rest in such a case should be forty-eight hours, after which graduated progress should be attempted on the same lines as described in Section I, but with an interval of twenty-four hours between each step and with a terminal three or four days' holiday when progress is uneventful. If symptoms are present, or if they should develop after a latent interval, they should be treated as already described, and the interval of freedom from symptoms before the next forward step is taken should be forty-eight hours. The skull should be *x*-rayed as soon after the injury as possible.

III. NEVER UNCONSCIOUS

If there are no symptoms, the patient who has not been unconscious should be rested in bed for twenty-four hours, and may then be allowed to return to his normal way of life. He should, however, be warned that symptoms (headache, giddiness, etc.) may occur after a latent interval, and that he must report at once if they do so. If symptoms of this kind are present from the first, or appear later, they should be treated on exactly the same lines as those described in Section I. The patient who has not been concussed may prove to require treatment as careful and prolonged as the man who has been unconscious for several days. The necessity for *x*-ray examination will depend upon the nature and severity of the injury.

CHRONIC SUBDURAL HAEMATOMA

Chronic subdural haematoma should be remembered as a rare sequel which may complicate head injury, even without concussion, especially in elderly patients. The development of progressive headache, drowsiness, or hemiparesis a few weeks or months after a head injury must therefore be regarded with the same suspicion and treated in the same way as it would be in the earlier stages.

CONCLUSION

It is advisable to inform the patient who has had a head injury, whether severe or mild, as soon as he is able to take an interest in his condition, that symptoms such as we have described are common and sometimes of long duration, but are benign, and that complete recovery is the rule. He will need often to be told that the time spent at rest until freedom from symptoms is procured will prove an economy in the long run.

The twelfth conference of the German Pharmacological Association will be held at Munich from October 20th to 23rd, and in connexion with it there will be a performance of *Don Giovanni* in the National Theatre and a motor tour through the Bavarian hills. The fee for membership of the conference is RM. 3. The programme is obtainable from Professor B. Behrens, Dorotheenstrasse 28, Berlin, N.W.7.

ONE HUNDRED AND THIRD ANNUAL MEETING

of the

British Medical Association

MELBOURNE, SEPTEMBER, 1935

THE SECTIONS

SUMMARY OF PROCEEDINGS

Publication of the opening papers communicated to the Scientific Sections of the Annual Meeting at Melbourne began in the British Medical Journal *of September 14th, and will be continued during the next few months. The reports of discussions in this and successive issues are intended to give members who were not present a general idea of the proceedings.*

SECTION OF MEDICINE

Wednesday, September 11th

Obesity

With the President, Lord Horder, in the chair, Professor C. G. Lambie (Sydney) opened the first discussion in this Section by reviewing the latest opinions about the aetiology and metabolism of obesity. He doubted whether it was right to assume that weight should increase with advancing age; there should be some relating of the amount of fat to the individual's physical type, which would prevent many ill-advised efforts to make bodily configuration conform to some general or fashionable standard. While it was reasonable to assume that obesity would result whenever there was a long-continued excess of intake over output of energy, the question was more complex than that. There was often present a disturbance of hepatic function, glycogen being laid down and carbohydrate being converted into fat with excessive ease. It was possible that a functional derangement of the metabolic centres in the hypothalamic region of the brain or of the neuro-hypophyseal mechanism might be primarily concerned in the causation of many cases of obesity which would thus be classifiable as neuro-endocrine. In some cases obesity appeared to be structural or developmental in origin rather than metabolic; these three causes summed up the aetiology. Metabolic obesity might be endocrine, nervous (hypothalamic), or neuro-endocrine in origin. The developmental group would be wholly hereditary, and the nutritional group entirely acquired, while the metabolic group might be either hereditary or due to acquired disease. In all varieties such variables as food intake and exercise played some part, and they were the primary factors in the nutritional group. The influence of heredity was suggested by the fact that 70 per cent. of obese subjects had overweight parents.

Dr. J. H. Anderson (Ruthin Castle) said that the first step in treatment was to distinguish the type of obesity, exogenous or endogenous or mixed. A careful history should be reinforced if necessary by an estimation of the basal metabolism rate, sugar tolerance tests, and radiogram of the pituitary fossa. The rational line of treatment in the exogenous group was to reduce the food and increase the exercise. Substitution therapy was called for in the endogenous type, and the mixed group demanded a combination of methods. In treatment four lines of attack were open: two major, diet and exercise; and two minor, drugs and physical treatment. In most cases of obesity diet and exercise were of paramount importance. Reduction diets varied greatly; a good one would be found to have reduced carbohydrate, enough to prevent acidosis, and a good deal of protein, providing if possible the two to four ounces required to repair the body's daily loss. Fat was strictly rationed, enough being given to carry the essential fat-soluble vitamins. Bulk was essential, and was made up by the use of fruit and vegetables. Exercise should begin quietly, and the amount prescribed should depend on the condition of each patient. The pulse rate and the blood pressure, before and after exercise, were useful guides in estimating how much was good. Drugs should find their greatest use in endogenous obesity, but, except in some cases due to hypothyroidism, diet and exercise were also necessary. Reduction of diet should be avoided in true hypothyroidism, as the patients stood it badly. In genital obesity, diet, exercise, and thyroid gave the best results, and the same three measures were necessary in pituitary obesity, with the addition of whole-gland pituitary. Drugs, especially thyroid, were controlled by estimating the basal metabolic rate and the tolerance to sugar, and by keeping a watch on the pulse rate. Thyroid medication required especially careful supervision. The patient should be given a limited amount at one time, or he should be made to omit the drug during the last ten days in every month. A dose of 1/4 to 1/2 of a grain twice a day was a great help even in cases of exogenous obesity, in addition to treatment by diet and exercise. Physical treatment increased comfort, but had little effect on the weight.

Dr. E. H. Stokes (Sydney) dealt with the association of arterial hypertension with obesity. As a result of the study of 1,000 individuals in regard to their body weight and blood pressure, Dr. Stokes was inclined to believe that the relation between these two conditions was more than coincidental. No other causal factor could be found than that of overweight among the patients recorded by him. He was prepared to admit that Cushing's work on the pituitary gland might mean that a common cause might be provided by the pituitary for both hypertension and obesity. On clinical grounds deficiency of thyroid secretion was but rarely responsible for either hypertension or obesity. He considered that the adrenal gland played a more important part, and that even if no adrenaline could be found in the peripheral blood of hypertensive patients the patient might still be sensitized to adrenaline. He did not think that cholesterol could be a sensitizing agent, as a study of the blood cholesterol in the content of the obese failed to show any constant elevation. While obesity was not necessarily caused by hypertension, the causative factors seemed to be closely associated.

Sir James Purves-Stewart (London) dealt with the endocrine aspect only, and the relation of this form of obesity to the nervous control of the ductless gland. He classified obesity of this type as follows: (1) Pineal obesity—this type was found in patients with pineal tumour, but in all such instances pressure occurred on adjacent organs or produced internal hydrocephalus. (2) Hyperinsulinism—such persons were frequently fat rather than thin. (3) Genital—eunuchism in the male and menopausal obesity in the female. (4) Adrenal—especially in non-destructive tumours of the gland in women and associated with involution of the uterus and adnexa. (5) Subthyroid—only to be diagnosed when the classical features of obesity were found. (6) Subpituitary—constituting the commonest form of all, due to a deficiency of the secretion of the basophil cells which were found in the anterior lobe of the gland and sometimes in the posterior lobe. Obesity with dwarfism occurred when the deficiency also affected the acidophil cells of the anterior lobe. The well-known Fröhlich syndrome was frequently seen in children with sellar and suprasellar tumours, showing characteristic pressure syndromes. Grave doubts existed as to whether this obesity was purely endocrine in origin. It was probably rather neuro-endocrine, as, for example, in the obesity of internal hydrocephalus causing compression of the infundibular stalk. (7) The Cushing syndrome—due to suprapituitarism of the basophil cells of the anterior pituitary, which was not entirely a secretory disorder. It was often associated with the characteristic sign of hyperadrenalism, hyperparathyroidism, and ovarian deficiency.

Professor R. G. Rudolph (Toronto) inquired whether the previous speakers had referred to body weight as calculated with or without clothing. Dr. Anderson replied that his figures referred to readings with the patients clad

in pyjamas, while Dr. Stokes stated that his patients had been weighed in ordinary clothing. Dr. S. L. Dawkins (Adelaide) inquired of Dr. Anderson whether he considered that a patient should change his occupation from a sedentary to a more active existence, as an aid to the reduction of obesity. Dr. Anderson replied that as the majority of his patients were over the age of 50 years such a procedure was rarely practicable.

Professor Lambie was asked to reply to the subsequent speakers, and discussed Sir James Purves-Stewart's paper. He was satisfied that fat distribution was of no diagnostic value in elucidating the cause of endocrinal obesity. The real diagnostic points were rather changes in the skeleton, skin, genitals, etc. It was important to pay more attention to the physiological distribution of fat. Following the use of drugs such as dinitrophenol, weight might be lost, but the lumps of fat remained in their characteristic sites. He referred, further, to the question of body weight in patients with hyperinsulinism ; while theoretically they should gain, the quantitative factor was such as sometimes to alter this rule. Obesity in diabetes was not always endocrine, but was frequently extrapancreatic in origin—for example, arising in the course of pituitary disease. This had been confirmed by experimental means. With regard to pituitary obesity he disagreed that obesity was due to deficiency in the gonadotropic hormone, since both genital dystrophy and obesity could appear separately and because the experimental injection of hormones has been shown by Cushing to cause obesity. Patients with pituitary obesity were frequently characterized by increased sugar tolerance. In support of this he called attention to the fact that the removal of the gonads in many animals did not cause obesity. In some cases of endogenous obesity an increased food intake occurred, probably as a response to a physiological need. Referring to Dr. Stokes's paper, Professor Lambie regretted that he had not correlated patients suffering from obesity and arterial hypertension with their degree of sugar tolerance. Such patients might have a pituitary dysfunction, though Cushing had not been able to reproduce arterial hypertension on the injection of pituitary extracts into dogs.

Diabetic Gangrene

Dr. A. Clarke Begg (Swansea) opened a short discussion on this subject by pointing out that the condition was definitely increasing in incidence owing to the longer life conferred on diabetics by insulin allowing arteriosclerosis to develop. Although hyperglycaemia might have a considerable influence, it was probable that disordered fat metabolism, associated with an excess of cholesterol in the blood, was the most important factor in the causation of diabetic arteriosclerosis. Arterial occlusion alone might be sufficient to cause gangrene, but there was usually an infective element, the actual onset being determined by some slight trauma which allowed the ingress of micro-organisms to the devitalized tissues. As a preventive measure the body weight should be kept below normal, and by means of dieting, with or without insulin, the body metabolism should be prevented from becoming abnormal. The diet must not contain an excess of fat, the urine must be kept sugar-free, and the blood sugar content within normal limits. The maintenance of good circulation in the legs must be encouraged by stockings, exercise, massage and hot foot baths, and meticulous cleanliness of the feet. The occurrence of moist spreading gangrene, with infiltration and tissue necrosis, called for amputation, whereas conservative methods were indicated in dry gangrene with little or no constitutional disturbance. The deciding factors as regards amputation were the degree and amount of sepsis and the condition of the circulation in the leg. While the presence of a thin, sanious, stinking fluid was the worst possible omen, the appearance of frank pus might be considered to be favourable. One would be more ready to temporize in a case which had not previously had adequate diabetic treatment. Free drainage must be assured for the sinus at the base of gangrene of a toe ; this might be secured by making the patient lie in the prone position for a considerable part of each day. Dr. Begg maintained that the principal risk attending diabetes nowadays was the supervention of arteriosclerosis and gangrene, and that this risk could be minimized by giving efficient treatment to diabetics of all ages, instructing every patient in the care of the feet, and impressing upon them the necessity of lying up and getting medical advice at the first sign of trouble.

Dr. J. C. Matthews (Liverpool) pointed out the usefulness of the aneroid capsule attached to a sphygmomanometer band applied at varying levels along the affected limb as a means of estimating the degree of arterial obstruction. It was usual to find a deflection of the needle of 6 millimetres in the centre of the calf in a healthy individual, but considerably less in the diabetic with early gangrene. He warned against waiting for a line of demarcation to appear ; as a means of preventing gangrene in the amputation flaps he advised thorough biochemical control and insulin treatment both before and after operation. Dr. M. D. Silberberg (Melbourne) referred to the apparent association between arteriosclerosis and disorder of the cholesterol metabolism. He considered it most important that the affected limb should be kept thoroughly dry by the use of methylated spirit and the employment of dry heat from electric light bulbs under a cradle. He preferred eusol as an antiseptic if any infection were present. Gangrene of the soft tissues was a danger in diabetes equal to that of gangrene of the extremities.

Dr. Kempson Maddox (Sydney) urged the early amputation above the knee of patients with established diabetic gangrene so as to allow them to walk early on a peg stump, especially in those patients who were elderly and of poor social position, since the expectation of life in general was so short. He agreed as to the great value of the Pachon oscillometer, but was satisfied that a careful history and the simple postural tests of Pickering gave all the information required. With regard to operation the danger was rather the result of associated arterial disease in the heart, kidney, or brain than of death from diabetic coma. Dr. E. Cooper (Melbourne) praised the weak tincture of iodine as an antiseptic for diabetic patients with infected feet. There was great danger of inducing gangrene of soft tissues away from the extremities by the use of strong antiseptics. He had obtained considerable help in the diagnosis of arterial disease from observing the conditions of the retinal arteries. In almost every case of diabetic gangrene extensive degeneration was visible in the fundi. Every case of gangrene was not necessarily diabetic in origin. Sometimes glycosuria and ketosis were secondary to toxaemia arising from an infected extremity.

SECTION OF SURGERY

Wednesday, September 11th

Hydatid Disease

With Sir Thomas Dunhill in the chair, Professor Harold R. Dew (Sydney) opened a discussion on hydatid disease. His paper was published in the *Journal* of October 5th (p. 620).

Mr. B. Kilvington (Melbourne) discussed the important and rather neglected group of calcified hydatid cysts. The adventitia after some time thickened, more especially in the liver, and in it lime salts might be deposited. The *x*-ray appearances were characteristic. These cysts were usually dead, but sometimes contained live daughter cysts. Occasionally degenerated cysts also contained lime salts which had been deposited in the membranes themselves following caseous change. Calcification had been present in seventy-eight (23 per cent.) of the 342 cases of hydatid disease occurring during the past ten years at the Melbourne Hospital. Of all cysts 70 per cent. occurred in the liver, but of the calcified cysts sixty-seven (86 per cent.) were in the liver. Calcified hydatid cysts usually caused no trouble unless they became infected. They were found by accident at *x*-ray examination, operation, or necropsy. In the present series thirty-six (46 per cent.) were so discovered and were symptomless. Of the series 5 per cent. showed a positive response to

either the Casoni or complement-fixation test, though these might be due to other and living cysts. Treatment of hydatid disease was, when possible, closure of the adventitia after evacuating the cyst content and swabbing the lining with formalin. Discomfort and delay in convalescence was so avoided. With infection, drainage was of course essential, but owing to the non-collapsible nature of the cyst might go on indefinitely. Another method of treatment which Mr. Kilvington had carried out twice with success was to evacuate and formalinize the cyst and crush the adventitia. This separated later, and was removed with forceps six weeks afterwards. This appeared to be the only method of shortening the indefinite discharge resulting from the customary treatment by simple drainage.

Professor CARMALT-JONES (New Zealand) discussed the life-history of the *Taenia echinococcus*. He pointed out that a primary cyst acted as a benign tumour, producing pressure effects only, if any. It obtained its nourishment from the host, the walls being pervious, and in the early stages enough material often passed out of the cyst to sensitize the host's tissues and give a positive skin reaction. The fibrous adventitia, derived from the host, might become so thick as to starve the cyst, which then died, and the adventitia might become calcified. The record primary cyst contained twenty-two pints of fluid. If a cyst wall was injured the life of the parasite might be preserved by the development of daughter cysts of similar structure to that of the primary cyst, probably by cystic transformation of the scolices. Such a cyst was very much like a malignant tumour, for the reason that it might produce untoward effects as a result of rupture. In addition to pressure effects, the two grave risks of hydatid disease were suppuration and anaphylaxis.

Mr. HUGH R. G. POATE (Sydney) discussed the intrabiliary rupture of hydatid cysts. This was more common than was generally thought and was always of interest, as the true nature of the case was generally unsuspected until the patient came to operation. It was worthy of note that Professor Dew believed that it was the most common complication of hepatic cysts. Erosion of and leakage from some of the smaller bile ducts surrounding the cysts might occur. Debris might find its way into these ducts, and partial or complete blockage at the ampulla of Vater with consequent jaundice might occur. Pain was not usually so severe as with the ordinary gall-stone attack, and as a rule patients were much younger that the average age for gall-stones. In an otherwise healthy young adult, recurring attacks of mild jaundice, perhaps with some pyrexia, should arouse suspicion of hydatid disease. Mr. Poate felt that the possibility of natural cure was so remote and the probability of septic complications so great that if the diagnosis was made, or the condition even suspected, early operation should be undertaken. He described the operation of drainage, but said that occasionally it was impracticable to drain a very deeply situated cyst by direct approach. In these circumstances the cyst should be cleared as far as possible by way of the common bile duct, after which a small tube should be passed up to it through the duct, the free end being brought to the skin surface through a lumbar stab wound. Following this, syringing with saline or weak iodine solution effectively cleared any remaining debris in from seven to ten days.

Dr. S. C. FITZPATRICK (Hamilton, Victoria) said that he practised in a district of heavy incidence of hydatid disease, and had seen eighty-seven cases. He dealt particularly with pulmonary cysts. He stated that it would be expected that in a homogeneous medium growth would be equal in all directions. This did not occur, and Dr. Fitzpatrick discussed the factors which determined the direction of growth, these being principally the relation of the growth to the bronchial tree and to the pleura. It seemed that these factors were of some importance, and he suggested that the elongation of an "unemerged" cyst indicated that part of its surface had reached the interlobar fissure; that an "emerged" cyst would show flattening on its parietal aspect; that a secondary pleural cyst would show elongation parallel to the ribs (or intercostal spaces) immediately external to it; that an intramuscular cyst would show elongation parallel to the muscle fasciculi. Dr. Fitzpatrick next referred to the treatment by means of artificial pneumothorax, by which five carefully selected patients with ruptured parabronchial cysts were treated. Three of these lost their sputum and their recurrent haemoptysis, gained weight, and returned to work much sooner than if no such treatment had been given. Probably only a small proportion of patients were suitable for artificial pneumothorax treatment, but it appeared to have a definite value in carefully selected patients who were free from pleural adhesions.

Dr. KEITH D. FAIRLEY (Melbourne) discussed the laboratory diagnosis of hydatid disease. Eosinophilia was useful only as suggesting investigation by more specific tests. The precipitin test closely paralleled in its results the complement-fixation test, but minor reactions were difficult to interpret. The complement-fixation test was specific, but failure to react was of no value in excluding hydatid disease. The results were positive in only 54 per cent. of pre-operative tests with primary or recurrent or residual cysts. The fixation of six or more minimal haemolytic doses of complement suggested that some complication had occurred in the cysts. Within two or three months after operation the serum might fail to react with the test. The fixation of six minimal haemolytic doses of complement nine months after operation suggested the presence of residual cysts, as also the fixation of three minimal haemolytic doses more than two years after operation. The chief value of the test was in the diagnosis of primary suppurating or ruptured cysts and of residual recurrences. Since some patients reacted with this test, but not with the intradermal test, both should be employed in the pre-operative diagnosis of primary cysts. In regard to the intradermal test, the delayed reaction should always be looked for, as occasionally a positive result might appear when the immediate reaction failed to develop. The immediate reaction was of great value in the pre-operative diagnosis of primary cysts, but was of no help whatever in the diagnosis of recurrent or residual cysts. Repeated injections of the same field might sensitize the skin in this locality and lead to fallacious results. In primary pre-operative cases a positive result was obtained in approximately 75 per cent. of those with uncomplicated or degenerating and degenerated cysts. After operation the reaction was almost invariably positive, and usually remained so for many years. Results showed that after the primary operation a negative result might suggest but did not prove cure, while a positive result was of no significance in the diagnosis of recurrent cysts. The high incidence of latent cysts (1.6 per cent.) discovered at necropsy necessitated post-mortem proof of the absence of hydatid infestation when an apparently fallacious positive result was obtained. One of the chief values of the test was in excluding hydatid infestation. Over some two thousand cases a negative response had correctly indicated the absence of hydatid disease in 95 per cent. Mr. A. J. TRINCA (Melbourne), Mr. H. B. DEVINE (Melbourne), Mr. BALCOMBE QUICK (Melbourne), and Mr. JENKINS (Dunedin) spoke against the injudicious use of formalin. Mr. MURRAY MORTON (Melbourne) said that formalin should come in contact with the parasite only, and should not be left in the cyst cavity. The PRESIDENT thought that something better than formalin might still be discovered. He stressed the fact that the hydatid cyst was, in general, an innocent tumour, and that there was no urgency about operation unless complications ensued.

Professor DEW, in reply, agreed with Mr. Kilvington that calcified cysts should be left alone as long as possible. He drew the attention of the meeting to the Registry of Hydatid Disease being kept by the Royal Australasian College of Surgeons. While he was in complete agreement with Mr. Poate in regard to the treatment of rupture into the biliary passages, he said that too much interference with a sick patient might have fatal results.

Formalin was being used too strong, in too large quantity, and too much was being left behind. A cyst four inches in diameter required 6 c.cm. of commercial formalin to produce the necessary 1.5 per cent. solution. Formalin was almost useless with mu.tiple daughter cysts. Saline solution must be put in before closure. The presence of air predisposed to mild infection.

Surgery of the Pancreas

With Sir Henry Newland (Adelaide) in the chair, Mr. Harold Upcott of Hull opened a discussion on "Surgery of the Pancreas." His paper appeared in the *Journal* of September 28th (p. 567).

Mr. F. C. Pybus (Newcastle-on-Tyne) first emphasized the almost constant association of pancreatitis with biliary infection. After gall-bladder operation patients occasionally experienced pain, a rise in temperature, and jaundice due to a mild pancreatitis which usually subsided without trouble. Occasionally the attacks took place with sufficient frequency and severity to suggest the recurrence of the stones. Only one phase of the condition was seen during operation, so that it was unreasonable to describe what was seen as a particular type of pancreatitis. All types might be different stages of a similar infection. The symptomatology varied greatly according to the stage at which the patient was seen and the severity of the infection. There was no one clinical picture. The first symptom was pain, commencing in the epigastrium and radiating to the right or to the left subcostal region, or both, according to the part of the pancreas involved. It was sometimes referred to the back, or to the subscapular region on either side. It was of great importance in determining the amount of pancreatic involvement. Epigastric tenderness was present, but there was no rigidity. There was fever. Jaundice was variable. Specific tests were of little use, as the degree of pancreatic destruction varied enormously. The chief difficulty in diagnosis was to distinguish the condition from cholecystitis and perforating peptic ulcer. He agreed with Mr. Upcott on the subject of treatment. He was doubtful whether incision and drainage were worth while. If he could make the diagnosis with any degree of certainty he preferred to leave the patient alone, and to deal later with any abscess that might develop.

Mr. Balcombe Quick (Melbourne) discussed the frequency of acute pancreatitis. There was an extraordinary disparity between its incidence at the Melbourne Hospital and at the Johns Hopkins Hospital, Baltimore. The apparently higher incidence in Melbourne was almost certainly due to a more general recognition of the disease, and this was the result of the great interest taken by the staff. Errors in diagnosis were most commonly due to failure to recognize that the possibility of its presence existed. The cardinal points in the clinical syndrome were pain, vomiting, and tenderness. A careful consideration of the pain was of great assistance. Estimation of the urinary diastase was of definite help. Following the use of this test the pre-operative diagnosis of the condition at the Alfred Hospital had risen from 30 to 100 per cent. Absolute abstention from all feeding by mouth was of great importance in treatment. Seeing that treatment without operation gave the best results, the diagnosis must be made without possibility of error. Even with the fullest consideration, some cases were excessively difficult to distinguish.

Mr. Upcott, in reply, again referred to the desirability of avoiding operation. This could only be justifiable if the diagnosis was a certainty. He was indebted to Mr. Quick for the information about the diastase test. He thought that the explanation of the disparity between the figures at the Alfred Hospital and at the Johns Hopkins Hospital was that the figures in the latter instance had been taken from the hospital statistics for the last fifty years, and in the former for the last ten. Diagnosis of recent years was much more accurate, and if the Johns Hopkins Hospital figures for the last ten years were available they would very probably correspond to Mr. Quick's figures from the Alfred Hospital.

SECTION OF OBSTETRICS AND GYNAECOLOGY

Wednesday, September 11th

Caesarean Section

Dr. J. S. Fairbairn presided over the first meeting of this Section, which comprised two discussions. The first, which dealt with Caesarean section in obstetric practice, was opened by Mr. J. Bright Banister.

Mr. Banister complained that this procedure had degenerated from being a life-saving attempt into an apparently easy way of avoiding difficulties, without regard to its perils. He reported the results of studying a series of 3,486 cases, partly from British hospitals and partly from Brooklyn in the United States, in support of this stricture. There had been an enormous increase in the incidence of this operation, often for such slender reasons as failure to progress, advanced age of the mother, breech presentation, previous repair of perineal tears, and unwillingness to undergo the pains of labour. In the 3,486 cases there had been a maternal mortality of 6.6 per cent., contrasting notably with the gross maternal mortality following childbirth in England and Wales, which at present was about 0.45 per cent. In the figures of the Registrar-General for 1932 there were some 170 deaths following Caesarean section. Mr. Banister thought that the basic fault was the taking of a surgical outlook upon obstetrical problems, and the development of a contempt for Nature, with her more deliberate and painful but very much safer technique. This was especially noticeable in the modern treatment of cases of disproportion in which Caesarean section was employed without giving nature any chance, or after a travesty of the trial labour. There was also a too common failure to appraise by examination the exact conditions in a given case; such an appraisement was only rendered possible by a prolonged practical training in obstetrics. Increasing value was being attached to the life of the child in view of the falling birth rate, and the speaker thought that too little importance was assigned to the preservation of the life of the mother. It was sufficiently realized that the risk of an abdominal operation was five times greater than the minimal mortality of childbirth.

Professor J. B. Dawson (Dunedin) said that they had been told that day that Caesarean section carried a mortality of 5 to 6 per cent., and this had been compared with the general maternal mortality of 0.45 per cent. Such a comparison was surely unsound—it compared the evil with the good. A Caesarean section mortality of 5.8 per cent. meant that of one hundred women confronted by grave obstetric difficulties or emergencies which were overcome by abdominal delivery about six would die. What they did not know was what would have happened to these hundred women if their obstetric dilemmas had been circumvented by other means. He ventured to suggest that the mortality would have been similar or worse. Such figures were difficult to obtain, but minor disproportion overcome by high forceps delivery or craniotomy would give a maternal mortality of at least 6 per cent., whereas for central placenta praevia Caesarean section gave better results than version. Beckwith Whitehouse had pointed out that central placenta praevia treated by version had a mortality of 8.5 per cent. and by section of 6.6 per cent. Nevertheless, the death rate following the operation was too high. It would not be difficult to collect a series of cases from the work of one man or one clinic that would show a negligible mortality. In British countries to-day it was not that too many sections were being done but that too many were being done too late. The disasters did not follow prompt decisive action, but operations performed after long delay, begotten by hesitation out of hope, a delay which added a terrific risk to subsequent operations. It was, however, obvious that provision must exist or be made for the prompt diagnosis of obstetric difficulty, and that the delayed operation should be eliminated.

Dr. W. Ivon Hayes (Melbourne) said that in fifteen years the Women's Hospital, Melbourne, obstetrical staff

had performed 545 sections in a total of 43,727 deliveries with a mortality of 6 per cent. Indications were: contracted pelvis and disproportion (345 cases, ten deaths, or 2.9 per cent.); eclampsia (thirty-eight cases, eight deaths, or 21 per cent.); renal toxaemia (twenty-three cases, three deaths, 13 per cent.); contracted pelvis with eclampsia or renal toxaemia (eleven cases, two deaths, or 18 per cent.); accidental haemorrhage (fourteen cases, three deaths, or 21 per cent.); placenta praevia (forty-seven cases, one death, or 2.1 per cent.). In severe concealed accidental haemorrhage section had been abandoned and replaced by blood transfusions, etc. There was a definite place for section in the treatment of placenta praevia, but only in selected cases as follows: (1) any degree of placenta praevia in a primipara not in labour, (2) any central placenta praevia, and (3) any degree of placenta praevia when the child was a "good risk" and specially desired. In gross disproportion the routine treatment had been elective section. Fatalities tended to occur in the cases operated on late in labour; thus long trials of labour prior to section were to be condemned. Of the 345 sections in the disproportion group 297 were performed while the membranes were intact or within twelve hours of their rupture, with a mortality of 1.3 per cent.; forty-eight patients were operated on later than twelve hours after rupture of the membranes, with a mortality of 12.5 per cent., sepsis being the cause of death in each case. Thus a classical Caesarean section might be done in those cases in which the membranes had not been ruptured for more than twelve hours and in all others the lower uterine technique and drainage or hysterectomy should be performed. In Dr. Hayes's opinion lower segment Caesarean section had so many advantages that it should become the regular method of abdominal delivery among obstetric surgeons. Hysterectomy was indicated when the patient showed signs of definite infection and when the membranes had been ruptured a considerable time or when there had been a history of repeated examinations or repeated attempts at delivery.

Dr. H. A. Ridler (Sydney) said that it might be stated generally that the greater the number of Caesarean sections performed by an obstetrician the less was he competent to arrive at a sound obstetric judgement. They all agreed with Mr. Banister's statement regarding the great widening of the indication during the last twenty years. This was the result of modern times of love of the dramatic, of the desire to earn a big fee easily, and of the love of speed. Caesarean section was so quick, the art of obstetrics took too long and was wearisome to learn. Some patients even liked Caesarean section with the prospect of sterilization. Many primiparae with slight diminution of pelvic measurement had been subjected to Caesarean section without being allowed to come into labour. No one could tell for certain before labour commenced whether a foetus would pass through the pelvis or not. Some of the recent indications for Caesarean section were real and absolute—for example, congenital absence of vagina, rigid cervix following radium therapy, and previous rupture of the uterus. His experience had been that the lower segment operation gave a lower death rate. Dr. F. Brown Craig (Sydney) said that mature obstetrical opinion should be obtained before Caesarean section was performed, and that it should be performed by an experienced obstetrician and not by a surgeon. Dr. E. R. White (Melbourne) referred to the primiparae in the early forties, and quoted the case of one who delivered herself with ease at the age of 44. He also raised the question of the common complication of post-operative distension, advocating its prophylaxis by pre-operative treatment and by careful sewing up of abdominal walls.

Dr. John Green (Melbourne) suggested that the "blurring" of diagnosis was possibly responsible for the divergent views on the operation. He wanted to know why the incidence of operation was twice as great at Queen Charlotte's as at Melbourne Women's Hospital, and why it was so seldom used at the East End Maternity Hospital. He also wondered what Mr. Banister would say to the patient's relatives in the case of a difficult forceps delivery in which there was no real danger to the mother, but real danger to the child.

Mr. Banister, in reply, stated that Nature was not quick; therefore, as observers of her art, obstetricians should not be quick. They often noticed cases in which the first stages of labour were prolonged and the second stage terminated the case comparatively quickly. If the elderly primipara showed indication for Caesarean section then the case became an obstetrical problem and not one of "how to deliver a woman of over 42." In answer to Dr. Green, he stated that at the East End Maternity Hospital the cases were mainly delivered by the matron, who was one of the outstanding obstetrical women of the world; that this hospital served the same district as the London Hospital, but that practitioners sent apparently normal cases to it and cases that might be difficult to the London Hospital. His advice was to say nothing to the relatives until the practitioner had made up his mind, and for this a full examination under a general anaesthetic was necessary.

Placenta Praevia

Sir Comyns Berkeley opened a discussion on this subject by considering the conclusions to be drawn from a series of 4,374 cases abstracted from 130 reports of nineteen hospitals. The chief rules in treating placenta praevia were: to control the bleeding as soon as possible; to combat any shock; to prevent sepsis; not to hasten delivery, apart from cases of Caesarean section; not to make a pelvic examination before one was quite ready to begin treatment; not to expel the placenta until it was entirely separated unless there was dangerous bleeding; if it was necessary to perforate the placenta, to do so with a sharp-pointed instrument; if it was necessary to pack the vagina, to soak the material used in an efficient antiseptic; and to avoid Caesarean hysterectomy if possible, in view of the high maternal mortality involved. In complete placenta praevia the investigation of the statistics showed that the safest method for both mother and child was Caesarean section, the pregnancy having lasted for thirty-six weeks or longer; when it was shorter than this, section resulted in a rather higher death rate for mothers than that attached to bringing down a leg in a breech presentation, but the percentage of live children born was very much higher. Even when the foetus had died Caesarean section seemed to be the safest method of extraction, except when the pregnancy had lasted less than thirty-six weeks, when bringing down a leg in a breech presentation caused less maternal mortality. It was justifiable to perform Caesarean section in multiparae over thirty-six weeks pregnant, but not under. In incomplete placenta praevia the best treatment was shown by the speaker's statistics to be rupture of the membranes, the application of a binder, and leaving the labour to terminate normally. In lateral placenta praevia the safest course was to allow labour to progress without any intervention, the next in order of safety being rupture of the membranes and bringing down a leg in breech presentations. Packing the vagina was very dangerous, owing to the risk of sepsis, nor was it an easy procedure. It could only be justified when dangerous bleeding had supervened before the patient could be moved to hospital; when the patient had lost too much blood to permit the performing of Caesarean section, was still bleeding, and was awaiting a blood transfusion; and when there was a sudden and severe bleeding following vaginal examination and no immediate other treatment could be instituted.

Professor J. C. Windeyer (Sydney) said that he had no doubt that this stupendous compilation of statistics and the deductions therefrom by Sir Comyns Berkeley would prove to be of world-wide importance. The opener had mentioned that treatment of placenta praevia by a single rather than by composite methods gave more favourable results. Professor Windeyer suggested, as an explanation of this, that (1) the cases treated by composite methods were the more severe cases; (2) the

operators had less skill and experience. There was no doubt that the best results were obtained when the patients treated had been under the direct control of one capable man in the hospital. In obstetrical teaching hospitals it was a necessity for students and resident medical officers to learn how to perform obstetrical operations, and thereby the results obtained might not reach the ideal. He advocated "scalp" traction for the following reasons: (1) It could be used through a small os. (2) A minimum of vaginal and intrauterine manipulation was required. (3) Forceps could be applied in a short space of time (4) Traction could be applied to the handles by means of a light weight over a pulley at the end of the bed. In a hundred cases in the Royal Hospital for Women, Sydney, seventy-nine were vertex presentations, eleven breech, ten transverse or oblique lie, one an anencephalic monster. Thus scalp traction could be used in these seventy-nine cases, and Professor Windeyer was of the opinion that it should take the place of vaginal plugging and bipolar version. Control of haemorrhage during and after the third stage was of the greatest importance. If there was any blood loss an attempt should be made to express the placenta; if this failed it should be removed manually, and this should be followed by bimanual compression of the uterus and injection of pituitrin and ernutin. In one hundred cases treated at the Royal Hospital twenty-seven required no treatment beyond expression of the placenta; in fifty-eight the placenta was manually removed; in thirty bimanual compression of the uterus was performed; in two the uterus was packed with gauze. In vaginal plugging he used pledgets of cotton-wool which had been soaked in a lysol solution and squeezed dry. He never used gauze packing of the vagina.

Dr. A. M. Wilson (Melbourne) stated that at the Queen Victoria Hospital, Melbourne, in ten years there were forty-two cases of placenta praevia in 13,627 deliveries, almost all being drawn from the ante-natal department. At the Women's Hospital, Melbourne, in three years prior to 1934 there were sixty-two cases of placenta praevia in 10,124 deliveries, this higher incidence being due to the greater proportion of emergency cases. Thus placenta praevia was a comparatively rare complication of pregnancy. Owing to the greater appreciation of the surgical possibilities of these cases placenta praevia had lost many of its terrors for the obstetrician. The maternal mortality quoted in older textbooks varied from 5 to 15 per cent. Among the 103 cases quoted (one being excluded as the mother died just as she was being carried into the hospital) there were four deaths—a maternal mortality of 3.8 per cent. These excellent figures were due to the fact that the cases were treated by efficient obstetricians in specialized hospitals. The sudden appearance of a painless causeless haemorrhage was almost pathognomonic of placenta praevia. Once the condition was diagnosed the advisability of terminating the pregnancy should be considered. It was very rare for a patient with placenta praevia to die with a first haemorrhage, but it was quite certain that if she had had one haemorrhage before labour started she would have another. The most dangerous cases were those in which there had been repeated haemorrhages. In practice, if the internal os was slightly open the case responded fairly readily to medicinal stimulation and rupture of the membranes. If placenta praevia was central, or if the internal os was tightly closed or very rigid or hypertrophied, Caesarean section might be the method of choice. In treatment at the Women's Hospital, Melbourne, the blood of each of these patients was typed on admission against available relatives. Among the last sixty-two patients treated 11 per cent. required blood transfusion. Packing the vagina in these cases raised the morbidity from 20 per cent. to 50 per cent., and therefore should be used only as a temporary measure. In lateral or marginal placenta praevia, and in a vertex presentation, rupture of the membranes with or without the use of Willett's clamp, if the patient was in labour, was most satisfactory. In breech presentations rupture of the membranes, pulling down a leg, and leaving delivery to nature was the method of choice, but was accompanied by 80 per cent. foetal mortality. Braxton Hicks's bipolar version without extraction of the foetus was still the method of choice for the serious emergency, the delivery of the child being left to nature if efficient surgical facilities were not available. In central placenta praevia, especially if associated with primiparity, stenosis, rigidity, or hypertrophy of the cervix, Caesarean section was undoubtedly a life-saving operation for the mother, but the mother should be a good surgical risk and the hospital obstetrician and assistants should be efficient. This method of treatment was becoming more popular at the Melbourne Women's Hospital, but still the cases suitable for section were relatively small—forty cases out of 45,000 deliveries in the last thirteen years. In these cases there was one maternal death from pulmonary embolism, as the patient was about to be discharged from hospital; the foetal mortality, including neo-natal death, was 12.5 per cent. In conclusion, Dr. Wilson expressed strong approval of the Caesarean operation in picked cases and under picked conditions, but not to the exclusion of other methods of treatment which, in serious emergency, under inefficient conditions, and in the minor degrees of placenta praevia, would undoubtedly prove more satisfactory.

Dr. C. L. Lander (Plymouth), speaking as a general practitioner, condemned vaginal packing, and thought that bipolar version was very difficult in the surroundings in which a general practitioner was usually called upon to work. He preferred rupture of the membranes and evacuation of a large amount of liquor amnii. He advocated perforating the placenta with the forefinger, and thought that the patient should be kept on her back with the obstetrician's hand on the fundus and waiting for delivery. Dr. Elliot Smith (Brisbane) advocated vaginal packing, and said that the dangers associated with packing lay only in "hurry" and the surroundings under which it was done. He used intrauterine packing forceps for perforating the placenta. Dame Constance D'Arcy (Sydney) advocated Caesarean section in central placenta praevia, but was not in favour of the lower segment operation. She liked percaine given as spinal anaesthetic for these cases. The President, Dr. Fairbairn, said that as a rule the minor degrees of placenta praevia were over-treated. He advocated in these cases rupture of the membranes and application of an abdominal binder, and in central placenta praevia of over thirty-six weeks' gestation Caesarean section.

Sir Comyns Berkeley, in reply, said that Caesarean section was ideal for complete placenta praevia, rupture of the membranes for incomplete, and for lateral placenta praevia the patient should be left alone. He agreed with Dr. Wilson in terminating the pregnancy when once the patient had had much bleeding, and said that when placenta praevia was diagnosed the line of treatment should be determined and then carried out.

SECTION OF RADIOLOGY AND RADIOTHERAPEUTICS

Wednesday, September 11th

Radiation Treatment of Breast Cancer

With Major D. B. McGrigor in the chair, Mr. H. M. Moran (Sydney) opened a discussion on radiation treatment of carcinoma of the breast.

Commenting on the histological changes thus induced, he said that the breast was not favourably situated for external radiation, which had to be disposed tangentially, and some form of interstitial technique was therefore necessary. The complete sterilization of the growth, except for very small lesions, was rarely accomplished, and no barrier of fibrous tissue would stop extension. Radium, rather than radon, was the best supplementary therapeutic agent. In the treatment of the highly sensitive metastases, however, radiation therapy was very successful; skin metastases did not

justify surgical removal, and the radiation treatment of osseous metastases was often followed by the disappearance of the growth, recalcification, and the union of spontaneous fractures. The value of radiation therapy as an auxiliary to surgery in breast cancer was doubtful. At present its chief value lay in the treatment of patients in whom an operation should not have been performed owing to the intensive spreading of the growth, or where the operative technique had been faulty by reason of the insufficient removal of skin, or because of rough handling. It must be remembered that radiotherapy, as well as surgery, could fan to fierce activity the slow fire of malignancy. A much better case could be made out for pre-operative radiation. Radiographic examination of the thorax should be a routine precaution in duct cancer. There would appear to be no value in irradiation as a preventive measure in precancerous lesions.

Dr. R. A. GARDNER (Cairo) thought that the treatment of carcinoma of the breast from the radiologist's point of view was often hopeless. Palliation of the patient's condition could in most cases be secured, and more particularly when metastasis to the bones had taken place. With regard to damage to the underlying lungs, the possibility of fibrosis was materially influenced by the filter employed. Dr. Gardner asked Mr. Moran what he considered the optimum voltage for the treatment of the breast, having regard to the fact that the production of higher voltages was extremely costly. He also asked what was the mechanism whereby pre-operative radiation produced its beneficial effect when operative removal was carried out within two or three days. Dr. R. KAYE SCOTT (Melbourne) stressed the difficulty of the diagnosis of small breast tumours, the nature of which was often in doubt. As the ordinary biopsy was often the source of subsequent radio-necrosis he indicated his preference for the punch method recently advocated in America. He also laid emphasis upon the necessity of ensuring a homogeneous radiation distributed over the whole area included in the typical Halstead surgical operation. Dr. Scott showed lantern slides to demonstrate his method of radiating the whole breast and its grandular drainage area by means of radon needles, intensity being 1.5 millicuries per centimetre, and 0.8 mm. of platinum equivalent filter being used. In cases of glandular recurrence it was necessary to irradiate the whole glandular area, and no attempt should be made to treat individual glands by this means. Radium treatment alone was considered inadequate for large breast tumours, and *x*-ray therapy was employed in addition. He used 200 kV, a filter of 2 mm. of copper, and four ports of entry; each port received a dose of 800 to 900 *r* (international units).

Dr. E. H. MOLESWORTH (Sydney) made a plea for adequate dosage to the affected part, stating that he considered the beneficial margin between effective and ineffective radiation to be so small that none of it could be sacrified. An erythema was a desirable and satisfactory outcome of any course of treatment. Irradiation of the breast could be divided into pre-operative and post-operative courses. Pre-operative irradiation could be delivered by a fractional method involving large doses and a delay of two months before surgical removal could be carried out, this delay being necessary to allow the reaction to subside. On the other hand, a trial was being made of massive doses administered to two aspects of the breast on two successive days with immediate operation afterwards. Post-operative radiation should always be given with complete and adequate dosage six weeks later. His procedure was to give 250 *r* on alternate days through two ports of entry, directed according to Finzi's cross-fire method. The total of 1,500 to 2,000 *r* was administered to each field; after fourteen days' interval the breast was again resaturated with doses of 250 to 400 *r*. This usually caused a moderate erythema and some desquamation.

Dr. A. T. NISBET (Sydney) referred to the necessity for skilled pathological assistance to estimate the nature of the changes resulting in the irradiated cell, and advocated the efficiency of methods involving higher filtration. Dr. W. H. CUSCADEN was interested in the question of the association of pregnancy with breast carcinoma. He asked whether abortion should be procured or whether radon should be used, the patient being allowed to go to term; it was his practice to follow the latter course. He also said that operative difficulties in surgical removal of the breast were not increased by previous irradiation three months before. In most of these cases, however, the breast was found on examination to contain carcinoma cells.

Dr. MORAN, in reply to Dr. Gardner, said that the higher voltages increased the depth dose, and therefore the danger to the lung, though much of the so-called radiation fibrosis was in reality lung metastasis. The virtue of massive irradiation immediately preceding operation lay in the fact that those cells which were not killed were inhibited, the risk of dissemination at operation being thus reduced. He disapproved of the punch method advocated by Dr. Kaye Scott as fraught with danger, and thought that the only safe biopsy was a complete removal of the tumour mass preceded by radiation. An immediate examination should be made, and radical surgical removal of the whole breast should be undertaken if it were clinically or pathologically malignant. He was now beginning to believe that it was preferable to operate immediately after irradiation before the full tide of reaction set in. He agreed with Dr. Cuscaden that there was no indication for abortion on pregnant patients suffering from carcinoma of the breast.

Radiation Therapy of Lingual Carcinoma

Dr. R. A. GARDNER (Cairo), opening a discussion on this subject, said that the future control of malignant disease by radiation would depend in part on the discovery of means for accentuating the differential destructive action of radiotherapy on the more primitive types of tissue and the earlier beginning of treatment; the first stages of carcinoma of the tongue were eminently curable if sufficiently radiated before the malignant process had spread to the glands. Biopsy did not appear to increase the tendency to metastases. Extensive tooth extraction before the insertion of radium was not altogether advisable or necessary. The speaker discussed the relative values of the interstitial, surface, and distance methods of employing radium or radon seeds and *x* rays from various distances. The tongue should be packed away from the jaw in cases where much radium was disposed on the lingual lateral margin, but lead was not very suitable for this purpose. It was better to rely on distance and to use a hollow vulcanite box fixed to the teeth or jaw. The method of employing *x* rays at very short distances appeared to be promising, and deserved further practical trial. It did not injure the tumour to the same extent as did the insertion of multiple radium needles. When the regional glands were involved thorough ablation was as good a method as any of the others, but it had a rather heavy mortality rate; radium implantation through the intact skin seemed to be rather inexact, and uniform radiation in this way was not easily attained. Radiation by means of sources disposed on collar appliances allowed more uniform intensity of the dose, as also did beam radiation from a single source at a greater distance than in the case of appliances worn by the patient; in both the skin presented a limiting factor which might even prevent the employment of an adequate dosage to eliminate the malignant tissue. Dr. Gardner concluded with an attempt to assess the results of radiation treatment.

Dr. H. M. MORAN (Sydney) agreed with the general conclusion of the paper, but thought it unwise to dispense with the fixation suture in the radium needle. Success depended on the size, site, and histological nature of the primary lesion. If the tumour was large, extension to the bone and to the floor of the mouth rendered irradiation difficult. If the tumour was undifferentiated, metastasis to the cervical glands occurred early and destroyed the chance of cure, even though such lesions were fairly radio-sensitive. Most cures thus came from the anterior two-thirds of the tongue. Owing to the mechanical difficulties of implantation in the posterior

region of the tongue he considered that some such procedure as Coutard's technique in *x*-ray therapy was to be preferred to interstitial radium implantation, though possibly the latter might be used as an adjunct. Failure to appreciate the extent of the growth was a fruitful cause of radiation failures. Carcinoma of the floor of the mouth was exceedingly difficult to treat with radium owing to the liability to cellulitis of the tissues of the neck. He agreed with Dr. Gardner that it was not necessary to remove surgically defective teeth, and in most cases it was dangerous to do so owing to the liability to subsequent radio-necrosis. Complete surgical removal of glandular metastases was practically impossible, and radiation was almost always ineffective alone. Cures sometimes occurred with external irradiation plus implantation of radium needles with open exposure of the affected regions. He agreed with Dr. Kaye Scott that the whole glandular area could be irradiated and individual glands left to take care of themselves.

Dr. KAYE SCOTT (Melbourne) pointed out that multiple lesions were liable to occur in the tongue; after removal of one tumour the aetiological factors remained. One problem in treatment was the extensive woody tongue invaded by an infiltrating carcinoma. This type was liable to break down after radium therapy and was sometimes best left alone. For lesions of the posterior third he used long bent radon needles, passing over and through the posterior curve of the tongue, thus giving easier access and better distribution of the radiation. He had never seen complete resolution of metastatic glands after *x*-ray therapy alone, though palliation might occur. His practice was to irradiate glands and tongue at the same time with radium or radon needles; a pack was now never used owing to its deficient depth dose and adverse effects upon the skin. The whole glandular drainage area was treated with radium or radon needles on a systematic plan, and no attempt was made to treat individual recurrences.

Dr. A. T. NISBET (Sydney) stated that for glandular metastases it was possible, by using 275 to 300 kilovolts filtered through two millimetres of copper, to give to each side of the neck 3,500 *r* in sixteen days. Dr. VAL MCDOWALL (Brisbane) had found that after treatment of a tongue lesion on one side with removal of the glands on the same side recurrence was liable to occur some years later on the opposite side of the neck. He thought that the use of Chaoul's method was a retrograde step.

SECTION OF DISEASES OF CHILDREN

Wednesday, September 11th

Hare-lip

Dr. ROBERT HUTCHISON, President of the Section, took the chair at the first session, when Mr. H. DOUGLAS STEPHENS (Melbourne) opened a discussion on hare-lip. Mr. Stephens limited his remarks to the most severe common type—namely, the complete single cleft of the lip with accompanying cleavage of the alveolus and palate. In general, the problem was not so much the union of the lip as the creation of a satisfactory nostril. The speaker thought that the operation on the lip should be completed before the infant was 4 months old, since the pressure exercised by the musculature of the re-formed lip would push back the most prominent cleft alveolus within twelve months as a rule. He used to operate during the first few days of life, but of late years he had rarely operated on infants under 2 months old, unless the baby was growing vigorously. If the operation was postponed until after 6 months there was grave risk that the projecting alveolus would permanently overlap the opposite maxilla. Mr. Stephens then dealt with the problems of feeding and pre-operative treatment. For the operation ether was the sole anaesthetic, and was given by the drop method, followed by the introduction of an intrapharyngeal catheter through the nostril on the normal side. He outlined his usual operative procedure, employing a medial flap, which he preferred to the lateral flap, if its thickness and the depth of its red border was sufficiently good to ensure that fullness in the midline which was so essential to a satisfactory lip margin. He believed that the medial flap pulled the columella into a more median and vertical position, and indirectly tended to straighten the nose. If it appeared that a better lip could be produced by a flap from the side he employed the modification of the Mirault operation introduced by Blair and Brown. He did not fracture the projecting alveolus, since over-reduction was likely to ensue, with subsequent flattening and retraction of the upper lip. In dealing with the flap bleeding was stopped by mosquito forceps, and ligatures were never used. The backwardly hinged lip flap was often broader than necessary, and it might be advisable later to remove a strip of it. The formation of the medial flap and the insertion of sutures were then detailed. In post-operative treatment overheating of the child in bed should be avoided. No sucking from the breast was allowed until after the fifth day. Constant attention to the lip was imperative to prevent the formation of scabs or crusts, and in cleansing the nostrils there should be no manipulation which tended to loosen the stitches in the floor. The palate was repaired at the age of 2 years, and subsequent repairs to the lip were performed after the age of 4 or 5.

Sir HENRY NEWLAND (Adelaide) agreed that the complete single hare-lip with accompanying cleft of the alveolus of the palate was the most difficult type of hare-lip for surgical repair. He had not heard of a suitable embryological explanation for this defect. He did not agree with those who advocated operation in the early days of life. In the early weeks the tissues were more difficult to handle, and the consequent trauma had more serious effect, so he was in the habit of regarding 6 weeks to 3 months as the most suitable age for operation. At the same time it was consistent with orthopaedic experience that treatment should start as soon after birth as possible. With co-operation by nurse and mother one could begin correction of the hare-lip by appropriate pressure on the projecting alveolus soon after birth. The manipulations consisted of pinching up the lip and compressing it laterally during the first six weeks. He was quite in agreement with the pre-operative measures advocated by Dr. Stephens. The operation favoured by Sir Henry Newland was similar to that described by Sir William Stokes in his book on operative mechanical surgery. He preferred to cut the skin incisions before the tension was relieved by any undercutting. No tissue at all was removed in this operation. It was possible to give the deep surface an ample lining of mucous membrane, and there were large surfaces to coapt. It was important to avoid notching on the margin of the lip and linear depression extending down from the nostril. He did not use any dressings after operation. Tension was relieved by a silkworm-gut suture tied over a thin rubber tube, in addition to one within the mouth. The outer suture was removed within forty-eight hours and the others within five days whenever they affected the appearance. All surgeons who operated on hare-lip patients occasionally experienced the disaster of breaking down of the lip after the removal of the sutures. In the operation that he advocated no tissue was removed and reoperation was possible. It was difficult to get the ala nasi of one side to conform exactly to the shape of the other without resultant buckling, which was apt to leave a trumpet-shaped nostril, but later in life the buckling tended to disappear.

Mr. P. L. HIPSLEY (Sydney) compared the work of plastic surgery of the lip to that of an architect, which remained exposed to the public gaze. He was in the habit of using a method similar to that described by Sir Henry Newland. Dr. Stephens disregarded the cleft in the alveolus for the most part, but the gap usually closed by the time the baby was 12 months old. The tension was great, however, and Mr. Hipsley thought it important to bring the outer portion of the alveolus towards the midline to get firmer support when the septum was attached to one side. He closed the gap with silkworm-gut or wire suture in the manner of Brophy's operation. He knew that it interfered with the teeth germs, but he

felt that a better lip resulted. Dr. Stephens had stressed the freeing of the lateral portion from the maxilla, but Mr. Hipsley thought that the less the median portion was interfered with the better, on account of the danger of haemorrhage from the septal artery. In regard to the position of the patient at operation, Mr. Hipsley liked to have the child's head hanging back, and he found that a perineorrhaphy table was very useful. He thought the most favourable time for operation on a baby weighing nine or ten pounds was when the baby was a week or two old. He favoured very early operation: the family was relieved and the breast milk supply was saved for the baby. It was a little more difficult to operate on these very young babies, but there was no question that they stood the operation very well. With regard to the type of operation, he thought it important not to remove any tissue at all. When the flap was turned back a little prominence was left which might be useful in repairing the anterior portion of the cleft. He had abandoned all retentive apparatus.

Mr. R. Graham Brown (Brisbane) emphasized the importance of correcting the associated nasal deformities. The degree of deformity of the nose and the face varied with the width of the cleft in the lip ; it was necessary to correct the nasal deformity as an essential part of the operation. If this were not done the cosmetic result was worse and there was a tendency for the deformity to increase as the child grew. The surgeon always failed relatively, as no perfect operative result had ever been obtained, but the more experienced the surgeon the better was he able to select and adapt the method suitable in an individual case. By simple closure of the lip the patient's life would be saved, but good repair led to improved health and greater happiness throughout life. Mr. Graham Brown exhibited a number of diagrams illustrating Blair's modification of the Mirault operation, and demonstrated the advantages of taking nasal deformities into account as an important part of these operations. He regarded eight weeks as the most suitable age for operation, but stated that Blair would operate in the first forty-eight hours if possible ; otherwise Blair preferred the end of the second month.

Infant Feeding

Dr. H. Boyd Graham (Melbourne) opened a discussion on infant feeding. His paper appeared in the *Journal* of October 5th (p. 614).

Dr. E. H. Williams (Dunedin) stated that Dr. Graham had advanced a new method of calculating the nutritional requirements of babies. Dr. Williams did not think that there was much difference in principle between this method, that advocated by McKim Marriott of St. Louis, and the method used in New Zealand in which cow's milk was modified to resemble human milk in certain respects. He was glad that Dr. Graham in his paper had paid generous tribute to the Karitane Hospitals, and Dr. Williams felt, too, that in connexion with breast feeding the procedure at these hospitals had received general acceptance. He had read the article by Grover Powers to which Dr. Graham had referred, and also an article by Irving Fisher in the *American Journal of Physiology* upon which, he understood, Grover Powers had based his work. Powers had referred to the humanized milk method as obsolete or restricted in its use. He (Dr. Williams) gave this statement an unqualified denial, for he had used the method for nearly thirty years and was still satisfied with it. In comparing the percentage contribution of protein to the total calories, by Dr. Graham's method the protein contributed 14 per cent., by McKim Marriott's method 12 per cent., and by the so-called humanized milk method 9 per cent. It had been stated that one and a half ounces of cow's milk was approximately equivalent to two and a half ounces of human milk in biological value of the protein included. They should recognize that the protein consisted of parcels of amino-acids, only some of which were of real importance. The conclusions stated had been arrived at from animal-feeding experiments, and it was doubtful to what extent they were applicable to babies. He would not go so far as to say that as much as one and a half ounces of cow's milk was necessary as an equivalent for two and a half ounces of human milk. It was Dr. Robert Hutchison who, in the recent edition of his famous book, had referred to the fact that the correction of the relative proportion of caseinogen and lactalbumin, though theoretically sound, was not necessary from the practical point of view in the case of a normal healthy infant. Dr. Williams was in the habit of using a higher percentage of protein—namely, lesser dilution of the milk—for an under-weight infant until it reached the expected age-weight line, and then he made the mixture more dilute. In New Zealand, in deciding upon the theoretical caloric requirement, they took a number of factors into account, which included the age, the weight, the expected weight, the length, hereditary characteristics, and to a smaller extent the appetite of the baby.

Dr. F. H. le Messurier (Adelaide) agreed with Dr. Graham that the percentage composition of a mixture was not a reliable guide to the suitability of the mixture. The protein percentage was the most contentious matter when the suitability came up for discussion. Certain amino-acids, such as lysine, cystine, tryptophan, and tyrosine, were essential for growth and development, and could not be synthesized in the body. Lactalbumin was the most valuable protein in milk, and cow's milk contained a lot less than human milk. While the method suggested by Dr. Graham might be applicable to healthy babies, particular attention should be paid to the difficult baby that one met in a babies' home. The essentials deemed as sufficient by Dr. Graham would apply equally to whole milk with the addition of 7½ per cent. of sugar, and to a dilution of two parts of milk and one of water with the addition of 5 per cent. sugar. Such calculations made it difficult for the general practitioner to advise people readily. Dr. le Messurier did not like the percentage of fat to exceed 3, if the added fat was derived from kariol or cod-liver oil emulsion ; but if the fat were given in the form of butter he found that babies could digest a higher percentage. He used the Czerny-Kleinschmidt butter-flour mixtures for this purpose. The fat was approximately 4.4 per cent., and the protein varied between 1.5 and 1.7 per cent. He would like to know how people felt about the use of starch in feeding infants under the age of 6 months. He knew that it was common to oppose the use of starch for the young babies, but with the butter-flour mixtures he had been gratified by the progress made, and had not any difficulty with the digestion of starch even by a baby of 3 months. He felt it was likely that the wonderfully low infant mortality rate in New Zealand was due to the fact that in New Zealand between 80 and 85 per cent. of babies were breast-fed. He had not been able to obtain the figures for South Australia, but he did not think that they were so good as these. Possibly the low mortality in South Australia could be ascribed to the use of artificial feeding of milk in a digestible form, and free from pathogenic bacteria or other harmful ingredients, given in sufficient amount. He calculated that one ounce of milk was the equivalent of one gram of protein.

Dr. Robert Hutchison (London) said that as the result of forty years' experience in the feeding of infants he had come to the conclusion that the subject called for inexhaustible human ingenuity. He thought that Dr. Graham's paper contained a great deal of valuable truth, but he would warn him not to be too mathematical. Surely it was not so frightfully difficult to rear normal babies. In fact, he had often wondered at the invulnerability of the average baby. It almost seemed, at times, that gross underfeeding, such as resulted from untreated pyloric stenosis, did the babies good. It was surprising to see what fine specimens these babies were at 12 months of age. The important thing was to avoid setting up a disorder of digestion.

Dr. Robert Southby (Melbourne) drew attention to two other factors which might be of importance in infant feeding. The first was the size of the fat globule in a given sample of milk, and the second was the type of curd.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE

Wednesday, September 11th

Intracranial Tumour

Professor EDWIN BRAMWELL (Edinburgh), from the chair, opened a discussion on the diagnosis, prognosis, and treatment of brain tumour—fifty years ago and to-day.

He recalled the first reported case of removal of a brain tumour. In 1884 Hughes Bennett had diagnosed the case, and had persuaded Godlee to remove a tumour situated near the middle of the fissure of Rolando. Rapid strides followed in diagnosis and localization, but the earlier surgical results were disappointing. Operation was delayed until the general pressure symptoms were pronounced, the headache was unbearable, and the swelling of the optic disks threatened blindness. Hernia cerebri followed incision, and sloughing was common. With the expansion of the neurological horizon in the first decade of the present century diagnosis became more certain, and improvement in surgical technique slowly advanced. Since the war great strides had been made in radiology and operative efficiency; stereoscopic photography had now become the routine in every case of suspected intracranial tumour, secondary changes in the bones often affording valuable diagnostic information. Professor Bramwell, having reviewed the evolution of brain diagnosis and surgery, ended with a survey of the present conditions. He remarked that ventriculography, though not altogether free from danger, was often of the greatest value in localization and estimation of the size of a new growth. Encephalography had been less generally employed, but was safe and informative when there was no increase in the intracranial pressure. Comparing the present with the past, the speaker indicated the value of the pioneer work of Harvey Cushing, and recalled the chronological steps to successful operating: decompression to relieve tension; irreproachable wound healing; separate closure of the membranes by buried fine black silk sutures; local anaesthesia, supplemented when necessary by the rectal administration of tribromethanol; ventriculography; the use of a motor-driven suction apparatus; and the successive improvements in haemostatic methods. As regards the future, some form of treatment was still wanted for infiltrating tumours which would inhibit the reproduction of the neuroplastic tissue and leave unscathed the functional elements of the nervous system. Deep *x*-ray therapy was still in the experimental stage, and was a dangerous procedure.

Dr. K. HERMAN BOUMAN (Amsterdam) dealt with the subject of brain tumour and mental disorder. He said that since the clinical diagnosis of brain tumour was first made it had become obvious that mental disturbances would be found in many cases, and it had been formerly supposed that special mental disorders were connected with distinct areas in the nervous system. The general opinion was that this conception was not correct. Although many complicated symptoms of nervous disorder were to be found in certain cases of brain tumour situated in the frontal lobe, temporal lobe, or corpus callosum, the finding of such symptoms was far from being a general rule. If the tumour was situated in the foremost part apraxia was found, if in the middle part dyspraxia, and if in the posterior part hemianopia, in addition to the intense dementia. Dr. Bouman said that in tumours of the frontal lobe peculiar phenomena had been noted—a mixture of infantile, boorish, and good-natured behaviour. However, this was by no means typical or constant. Tumours of the diencephalon produced well-known motor disturbances and alteration of all the processes of metabolism. Tumours in the three situations mentioned were the only brain tumours that produced mental symptoms characteristic of their site.

Sir JAMES PURVES-STEWART (London) dealt with the diagnosis of brain tumour by encephalography and ventriculography when air or opaque substances were used. He showed a series of encephalograms, and said that pneumograms might be prepared either by injecting 150 c.cm. of air or by the more recent method of fractional encephalography. In the latter method only 3 to 5 c.cm. were injected, sufficient information being obtained thereby, and the possible ill effect of larger injections being obviated. Large injections might produce meningeal reaction or bring about cerebral oedema, endangering life. In suspected subtentorial lesions the practice was entirely contraindicated. Injection of opaque substances such as lipiodol or thorotrast had been used. Definite indications must be present before encephalography or ventriculography was used. They were important accessory methods, but were only supplementary to a complete neurological examination. They were more useful in excluding than in localizing brain tumour.

Dr. A. W. CAMPBELL (Sydney) said that great as had been the accumulation of assets since the time of Rickman Godlee, they had been far from empty-handed at that time. Dr. Campbell referred to Byrom Bramwell, Bastian, Buzzard, Jackson, and Gowers, and said that most living neurologists might hesitate to enter the lists against any of these in unaided bedside diagnosis or localization. In reference to brain tumours affecting children, he pointed out that while much more had been learnt of their pathology the child had not gained proportionately with the adult from improved surgery. The reason was that the majority of tumours in children were subtentorial, diffuse and rapid in growth, and appeared in situations which rendered them inoperable.

Mr. H. M. TRAQUAIR (Edinburgh) discussed brain tumour from the oculist's point of view. He said that great advances had been made in the last fifty years in the recognition and interpretation of "optic neuritis" or papilloedema. He considered that unilateral papilloedema was of no localizing value, nor was any measurement of the height of the disk on each side. The examination of the fields of vision occupied a very important place in diagnosis of brain tumour. However, the older methods were of no value. Small test objects should be used at a distance of up to 300 millimetres at least. Extraneous stimuli such as noise and light should be avoided as far as possible. The oculist played an important part in determining at what stage cerebral decompression should be undertaken to preserve sight.

Dr. J. K. SLATER (Edinburgh) dealt with the pathology and classification of brain tumour. He said that the present-day conception of neuroglia was a combination of two schools of thought—the Spanish, led by Cajal and Hortega, and the English, led by Bailey, Cushing, and Penfield. Dr. Slater traced the development of the embryonal nervous cell from its early stage to the most highly differentiated type. There were three types of neuroglial cell—the astrocyte (which might be fibrous or protoplasmic), and the oligodendroglia. Neoplasms might arise from either of these types at any stage in their differentiation from the primitive cell. The tendency nowadays was towards a less unwieldy classification of brain tumours. The modified classification included eight types: neuro-epithelioma, spongioblastoma multiforme, astrocytoma, ependymoma, medulloblastoma, astroblastoma, oligodendroglioma, unipolar spongioblastoma. The development of the nervous cell was a continuous process. For instance, there was no real difference between the astroblast and the astrocyte, so that it was necessary to search a brain tumour to discover the particular stage of differentiation which its predominant cells had reached. Apart from diagnosis, such a consideration would necessarily give valuable information regarding prognosis and the value of *x*-ray therapy.

Dr. L. B. COX (Malvern, Victoria) discussed the question of operability of brain tumours. He made an analysis of 200 cases, 197 of which had been examined microscopically. He found it convenient to divide brain tumours into those favourable and those unfavourable. Favourableness depended on the situation, size, and nature of the tumour. If a tumour was to be regarded as a favourable one it should be possible to remove it, partially or entirely, with relief of symptoms and without extensive damage to nervous tissue. Relief should be obtained for a period of not less than one year. This was admittedly a modest definition, but it was employed for the purposes of this paper. He divided his cases into

tumours above and below the tentorium. Of the former, fifty among 133 had been favourable. A large group comprised the spongioblastomata, which rapidly recurred after removal. The carcinoma group (11 to 13 per cent.) seemed large in comparison with American figures. Of the more favourable types Dr. Cox mentioned the fibroblastomata, which, however, frequently recurred in two and a half to three years. Many of the cerebral astrocytomata were inaccessible. Only 37 per cent. of these tumours were favourable. If from this the pituitary adenomata were excluded it was found that three out of ten supratentorial growths were removable. Dr. Cox discussed subtentorial tumours from the same point of view. Of this group, fortunately, only 50 per cent. were favourable as contrasted with the supratentorial group, the cerebellar astrocytoma being among the most favourable of all brain tumours.

Dr. J. F. MacKeddie (Melbourne) said that it was surprising how relatively tolerant the brain was to trauma. He considered that encephalography was perfectly safe in the normal brain, but emphasized the possible danger in a brain that was the site of a tumour, and, of course, in subtentorial lesions. Dr. H. C. Trumble (Melbourne) said that the cerebral surgeon must possess certain qualities to be able to carry on the work. These included physical and mental stamina, and that particular mental outlook which was prepared to accept a great deal of work with a very limited chance of success. The control of haemorrhage was still an important factor in the technique. He found that the use of living muscle was by far the most effective means of stopping a "vicious" bleeding. The question of anaesthesia was important, as were methods directed towards the conservation of blood volume during operation. Dr. E. Graeme Robertson described the method and use of angiography in localization of cerebral tumours and aneurysms. He said that 10 to 16 c.cm. of thorotrast were used, and short exposures were quickly made. The method appeared to be free from risk.

SECTION OF OTO-RHINO-LARYNGOLOGY

Wednesday, September 11th

Treatment of Maxillary Sinusitis

With Mr. Francis Muecke (London) in the chair, Mr. J. F. O'Malley (London) opened a discussion on the treatment of maxillary sinus suppuration. He approached the subject from the practical point of view, and considered what preceded sinus suppuration, why the maxillary type was not more common, why it occurred, how it could be cured, and what factors were to be counted on in this last respect. He said that the sinus remained healthy so long as its defensive air preparation and purification mechanism was unimpaired. Recovery depended on the persistence or regeneration of the cilia-bearing epithelium which McGregor and others had shown to be possible. Dental or intranasal primary infections had to be recognized and dealt with, and the blocking of sinus ventilation had to be removed. In the absence of intranasal causes the block to ventilation in acute dental cases was invariably vascular engorgement, which swiftly subsided on removal of the infected tooth and lavage of the antrum. Mr. O'Malley described the treatment of the acute pyrexial and later chronic stages, commending the local spraying of ephedrine in alkaline solution for the first as well as general treatment. In the subacute or chronic stages catheterization of the ostium was too uncertain to be valuable, but lavage, depletion by scarification, and antrostomy were useful procedures. In very chronic and complicated antral suppuration the thorough removal of the extensive oedematous tissues must always be associated with rigorous respecting of the almost complete integrity of the inferior turbinate. The antral lining might be entirely regenerated in six to nine months. A second opening in the hiatus semilunaris, provided by enlargement of the anatomical ostium region, secured thorough ventilation of the cavity and afforded a continued portal of output for ciliary activity.

Dr. J. F. Woodburn (Sydney) said that acute cases usually responded to conservative treatment if not complicated by infection of other sinuses. In chronic cases dental causes should be excluded. The allergic factor should also be considered before operations were performed. He personally favoured the Canfield-Ballenger operation in selected cases. Dr. Edgar Brown (Adelaide) drew attention to the increase of antral disease. In 1924 eleven operations for antral disease were performed at the Adelaide Children's Hospital, since when the number had steadily increased, until in 1934 it reached seventy-five. He had found the use of a 25 per cent. argyrol pack of great value in acute catarrhal rhinitis. In cases of antral infection following extraction of a tooth he favoured lavage combined with a high-fitting dental plate. Concerning scarification, as suggested by Mr. O'Malley, he had hitherto considered it an unsound surgical procedure because of the risk of causing a spreading infection. Unsatisfactory operative results in children were sometimes due to imperfect removal of adenoids. In chronic antral disease with polypi he could see no satisfactory method other than a radical operation.

Dr. Douglas Guthrie (Edinburgh) said that a general investigation of the patient should never be forgotten. The internal administration of alkali was valuable in sinusitis, as well as in bronchitis. When allergic manifestations were present the allergy should first be treated. It was said that maxillary sinusitis was commoner in Australia than in Europe. This might be due to the fact that all Australian cities were on the seaboard and that sea bathing was an important cause of sinusitis. Lavage of the antrum should be more frequently performed, so that many latent cases in which no pus appeared in the nose on examination would be detected and treated. Complete removal of the antral mucous membrane was seldom justifiable. The choice of operation—nasal antrostomy *versus* radical operation—would remain a matter of individual choice, but the rhinologist was wisely becoming more conservative. Further inquiry into non-operative methods of treatment, such as ionization, diathermy, and internal medication, was required.

Dr. W. N. Robertson (Brisbane) spoke of the evolution of treatment from the days of drainage via a tooth socket, and stressed conservatism in dealing with the mucous membrane of the antrum. Dr. J. Acomb (York) drew attention to the fallacy of antrum puncture as a test of patency of the ostium. Inability to pump fluid into the nose was often due to the trocar becoming buried in swollen mucous membrane. Dr. Leonard Johnston (Melbourne) had noticed, when in London some years ago, that in cases requiring operation intranasal antrostomy was the operation of choice; and so far as he knew the results were satisfactory. He had followed this practice in Melbourne for some years, but found that his results were very poor, so that he now performed the radical operation. Dr. Clive Eadie (Melbourne) believed that when the mucous membrane of the antrum was degenerated beyond recovery it should be removed entirely; and he was very satisfied with the result of this procedure. Dr. R. E. Buckingham (Orange, N.S.W.) suggested that the prevalence of sinusitis was possibly due to food deficiency. Country people in Australia consumed a great deal of white bread and tea, and their diet was deficient in vitamins. Dr. J. S. Monro (Palmerston North, New Zealand) stated that sinusitis was just as common in New Zealand, where they thought that the damp climate was a factor. He had little faith in nasal antrostomy.

The President, Mr. Muecke, supported Mr. O'Malley in advising medical treatment only for the acute stages of sinusitis. He considered nasal antrostomy most unsatisfactory, first because of the difficulty in maintaining a permanent opening, secondly, because of the inability to inspect the mucous membrane, and thirdly, because of the possibility of creating a valve-like action by pushing a piece of bone into the antrum. The Caldwell-Luc operation was the only procedure worth considering, and it should never have been called a radical operation. In actual fact there was less damage to the turbinates than in other operations. He had the utmost respect for the turbinates, and practically never interfered with them surgically.

Nasal Allergy

Dr. H. M. Jay (Adelaide) read a paper on nasal allergy. This will be printed in the *Journal* of November 2nd. Dr. Ivan Maxwell (Melbourne) outlined his routine in the investigation of allergy. Of a thousand patients tested between 1923 and 1929 some 60 per cent. gave positive reaction to skin testing. Of a hundred recent unselected cases over 90 per cent. gave reaction. This was explained by the fact that intradermal tests detected many otherwise obscure cases. In addition, previously unsuspected allergens were constantly being added to the routine list.

SECTION OF PATHOLOGY AND BACTERIOLOGY

Wednesday, September 11th

The Pathology of Osseous Tissue

With Professor J. B. Cleland (Adelaide) in the chair, Professor A. M. Drennan (Edinburgh) opened a discussion on the pathology of osseous tissue. He touched on the problems of calcification and osteogenesis, and then referred briefly to inflammatory lesions and changes involving atrophy, dystrophy, and hypertrophy. Osteitis fibrosa was now recognized as closely related to overactivity of the parathyroid, and was satisfactorily dealt with by the surgeon. Professor Drennan reported a case of osteitis deformans; there was slight hypertrophy of the single parathyroid gland, but there was no endocrine disease and no marked biochemical disturbance. Deposits of malignant disease in bone often necessitated the most careful search before the primary focus could be identified. In the skull an interesting reaction often occurred to the dural fibroblastoma (meningioma). When the tumour cells came into contact with bone they seemed to excite some proliferation of its cells, and bone formation occurred in a form of symbiosis with the tumour. Such growths might penetrate through the vault of the skull, and the firm, even hard, nodule be excised in the belief that it was a simple exostosis. Histological examination revealed its true nature. The benign giant-celled tumour was misnamed, for it often gave rise to metastases, possibly due to change of type of the tumour cell or to an originally obscured osteogenic character. Mention was made of the myelomas as frequently occasioning bone injury, and also of the endocrine glands, which affected the bones merely as part of their general body effect. When more knowledge was gained about the process of bony development into the natural shape without the influence of muscle action, it would be possible to understand better the pathology of osseous and other tissues.

Professor P. MacCallum (Melbourne) said that the behaviour of bony tissues in pathological conditions could be better understood if the calcium content was regarded as incidental, and the reactions as those of specialized connective tissue with fluctuations according to circumstances in the amount and condition of the intercellular matrix, its vascularity, and its cellular content. It would therefore vary from osseous to fibro-osteoid, to fibroid, to fibro-mucinous, to myxomatous, or to a cellular tissue, mainly osteoclastic, which the uninitiated would never suspect of bone relationship. There would be corresponding variations in the amount, disposition, and condition of its calcium content in accordance with environmental conditions. The quality of bony rigidity was dependent on the nature of the matrix as well as on that of the calcium impregnation. Mere density of calcium deposit was no guarantee of strength, as was evident in such conditions as "marble bones." Bone was not a satisfactory skeletal material unless calcium salts were present, not only in sufficient amount, but in the requisite form and relation to the matrix. The metaplastic range of the elements of bone tissue, as manifested in inflammatory dystrophic and neoplastic conditions, was of particular interest when contrasted with that usual fixity of cellular form and function which also made the occurrence of heterotopic bones remarkable. The observations of Harris and others on lines of arrested growth in childhood and related studies in disease processes in growing bones emphasized the interplay of environmental practice with the genetic determination of growth pattern. Though the vascular hypothesis of Leriche and Policard was not supported, it should stimulate inquiry into the vascular accompaniments of bone conditions. Pathologically it was a restatement of certain facts without obvious advantages. Analyses of the effect of internal secretions, vitamins, and variations in the supply of essential salts in the different stages of bone development were opening up the way to a better understanding of bone pathology.

Dr. Keith Inglis (Sydney) asked whether the destruction of osseous tissue was due to osteoclasts alone or to some other factor. He referred to heterotopic bone, and said that he had seen bone formation in the bronchus, the eyeball, and the liver. Dr. Edgar King (Melbourne) discussed a number of specific examples of metaplasia in connective tissue, especially Charcot's disease, Preiser's disease, and Kümmell's disease, and illustrated his remarks with lantern slides. He demonstrated the presence of bone marrow tissue in osteogenic sarcomata, and thought that his observations supported those of Borst. He discussed the possible interpretation of these observations, and referred to the evidence for considering that the bone marrow was actually formed in the tumour.

Dr. R. A. Willis (Melbourne) referred to the significance of osseous metaplasia in connective tissues. This occurred in scars, in chronic inflammatory tissue, in the walls of diseased arteries, occasionally in the stroma of carcinomatous growths, and in a variety of other situations. This capacity of fibroblastic tissue to change into obvious tissue under the stress of certain pathological conditions was the most striking instance of metaplasia, and was of great significance in pathology generally and in the pathology of bone in particular. Its general significance was that it showed that the tissues of the adult had not altogether lost the plasticity which was so characteristic of the early stages of development of the embryo. Experimental embryology had shown that the tissues of the pregastrular embryo were almost completely plastic; that was to say, their prospective lines of differentiation were not irrevocably fixed, for tissue from almost any part of the embryo was able, given an appropriate environment, to differentiate into almost any kind of adult tissue. During gastrulation the tissues commenced to lose their plasticity in a progressive way, so that the embryo became a mosaic of smaller and smaller parts, the fate of each of which was now fixed within relatively narrow limits. The occurrence of metaplasia, however, proved that even in the adult this fixation of tissues was not absolute and complete; and it would be a highly important general problem for future pathological research to determine the limit within which each variety of tissue was capable of changing its type in response to environmental changes. The phenomena of inflammation, tissue regeneration and repair, hyperplasia and neoplasia, all came into consideration. The special significance of bony metaplasia of connective tissues was, of course, in the pathology of bone. If fibroblastic tissue was able to become bone, then clearly this change might operate in some or all of the many diseases of bones in which proliferation occurred. In the repair of fractures, in chronic inflammatory diseases with bone sclerosis, and in osteoplasia associated with metastatic carcinomata or other tumours, osseous metaplasia of fibroblastic tissues might be in progress side by side with osteoblastic proliferation. It became essential to ask whether there was any real difference between a fibroblast and an osteoblast. An osteoblast might be the same cell as a fibroblast, but under a different set of external conditions. The occurrence of bony metaplasia of connective tissue on the one hand, and the ready development of abundant connective tissues in various rarefying diseases of bone on the other hand, at least suggested that in bone disease reversible osteoblast-fibroblast transformations might be of general importance.

Dr. J. V. Duhig (Brisbane) said that osteogenic sarcoma was associated with osteitis deformans in about 15 per cent. of cases. Dr. R. D. Wright (Melbourne) referred to the work of Leriche and Policard. He said that in a limb with an arterio-venous aneurysm there was no *x*-ray evidence of decalcification. Tuberculosis, which

was an avascular disease, caused decalcification, whereas syphilis, a vascular reaction, caused an increase in bone. The changes in the vessels might be a result of the bony changes and not the cause of them. Professor DRENNAN, in reply, said that he did not think osteoclasts were necessary for the absorption of bone. Osteogenic sarcoma was associated in some cases with osteitis deformans, and he had seen it in association with osteitis fibrosa cystica.

With Professor DRENNAN in the chair, Professor J. B. CLELAND (Adelaide) read a paper entitled "Leukaemic Infiltrations," and Dr. R. A. WILLIS (Melbourne) a paper entitled "Neural Components in Teratomata."

SECTION OF DERMATOLOGY

Wednesday, September 11th

Skin Diseases in Australia

With the President, Dr. S. WATSON SMITH (Bournemouth), in the chair, Dr. HERMAN LAWRENCE (Melbourne) opened the discussion on the incidence of skin diseases in Australia. An abridged version of his paper appeared in the *Journal* of September 28th (p. 572).

Dr. W. C. T. UPTON (Adelaide) said that roughly one patient in every eight had rodent ulcers or keratoses or both. Of these patients 40 per cent. were elderly women who had never used powder or face cream. The great amount of sunshine and low relative humidity of South Australia accounted, in his opinion, for the prevalence of the above conditions. He therefore thought that it was hardly desirable for people living in the interior of South Australia to protect their skins. He was rather surprised that there were not more cases of hydroa aestivale and xerodermia pigmentosa. He asked Dr. Lawrence whether he had noted any case of lupus erythematosus following acute sunburn. He had obtained a definite history of this kind in five out of twenty-five cases. Was the condition known as grain itch, which was due to a small parasite, the *Pediculoides ventricosus*, and usually occurred in those engaged in chaff-cutting?

Dr. F. H. MAKIN (Adelaide) said that he was associated with the Cancer Clinic at the Adelaide Hospital. A recent analysis of three thousand cases of cancer of both internal and external types showed that in approximately two thousand of these cases the condition was some form of keratosis or cancerous lesion of the skin. For the treatment of keratoses he preferred the use of deep *x*-ray therapy to radium, particularly when multiple lesions were present. Tinea of the feet and also dhobie itch were common, and were becoming more common. Tinea capitis was rare. Scabies was not frequently seen, but in the last two years had become more prevalent. Dr. J. M. A. O'DONNELL (Perth) said that conditions in Western Australia were very similar to those found in South Australia. Keratoses were so common that they were popularly termed "goldfields skin." He recommended that colourless lipstick should be used as a preventive measure. Plant sensitization was a common source of trouble in the spring due to dandelion, and in January due to stinkwort. Tinea capitis was very common, mainly of the trichophyton type, and he used thallium acetate for treatment. Dr. J. J. WITTON FLYNN (Sydney) suggested that ringworm infections were more common than Dr. Lawrence had stated. For the protection of the upper lip he would suggest that outdoor workers should grow a moustache. Dr. J. H. KELLY (Melbourne) said that in his experience sunburn was the precipitating factor in the majority of cases of lupus erythematosus. Lupus vulgaris was very uncommon in the native-born, probably owing to the protecting action of ultra-violet rays. Syphilis was a rarer disease than formerly. He would deprecate the use of deep *x*-ray therapy for keratoses; if deep therapy was used one was using actinic rays to cure a lesion caused by actinic rays. Therefore the areas around the lesion to be treated should be sharply screened off. He preferred the use of radium.

The PRESIDENT said that he recognized the necessity for charting diseases in different countries. A commencement had been made in Great Britain in some of the counties. In Great Britain keratoses were regarded as potential malignant conditions, and although he believed the exciting cause to be actinic rays, the relative low humidity was a definite predisposing factor. Favus was unknown in England but common in Scotland, where it was believed to have been introduced by Polish Jews brought to work in the mines.

Dr. LAWRENCE, in reply, said that he frequently found that lupus erythematosus followed sunburn. In an experience of over 80,000 cases of skin disease he had never seen in Australia a case of xerodermia pigmentosa. He regarded the use of deep *x* rays for the treatment of keratoses as somewhat like using a sledgehammer to crack a nut. He preferred his "wavical collision value" using β particles. He exposed the lesion for twenty minutes to intense β radiation and then added high-frequency for four minutes. He had had keratoses of his own successfully treated by this method.

SECTION OF PUBLIC MEDICINE

Thursday, September 12th

At the first session of the Section of Public Medicine (Tuberculosis, Industrial and Tropical Hygiene), and including the History of the Development of Medicine in Australia, Sir HENRY GAUVAIN gave an introductory presidential address on sea bathing in the treatment of surgical tuberculosis.

Tuberculous Empyema

Dr. M. P. SUSMAN (Sydney) opened a discussion on tuberculous empyema. (His paper is published this week at p. 659.)

Dr. A. S. WALKER (Sydney) said that tuberculous empyemata were uncommon but a source of grave anxiety. Methylene-blue and perhaps "metaphan" might prevent recurrence. Lavage was useful, but the fluid was often difficult to remove. Often it felt as though the pleura was gelatinous and that the lung was creeping up alongside the pus. Closed drainage was important. Mere passive inertia was undesirable. One should be ready, when necessary, to consult the thoracic surgeon. Contralateral disease made a difference. Secondary infection was not necessarily fatal. Mr. H. SEARBY (Melbourne) agreed that the patient, not the focus, needed attention. Too often the surgeon saw only the physician's failures. Group A were in his experience very few. In Group B if the lung expanded the empyema disappeared. In post-operative empyema rib resection might be necessary. All secondary infections required rib resection and all these patients were very ill. Mr. LEO DOYLE (Melbourne) said that if thoracoplasty was going to be necessary it should be done while the patient was still in good condition. The operation was not popular; people feared it, and so it was postponed until its best results could not be obtained.

Dr. G. A. PENINGTON (Melbourne) said that he washed out the pleural cavity with a 1 in 2,000 watery solution of metaphan and watched the progress of the patient by taking serial cultures (one drop on blood agar). As pneumococci increased the patient's condition improved. Cultivation of *B. influenzae* was difficult. Dr. R. W. COWAN (Adelaide) hoped that these operations might, by help of early diagnosis, become things of the past. They should try to keep the condition a closed infection; he favoured washing out the pleura with saline solution without antiseptics. Dr. R. B. ROSENTHAL (Melbourne) strongly favoured closed drainage as helping expansion. Gomenal, in thickening the pleura, might delay expansion. In oleothorax fistula might occur. He preferred lavage with bland fluids, such as eusol and saline solution.

Dr. SUSMAN, in reply, said that, while he favoured closed drainage, in Wales good results were claimed by the use of slow steady drainage with a tube into a bottle. For rib resection he preferred gas and oxygen general anaesthesia, instead of local anaesthesia. Metaphan seemed promising. Thoracoplasty might become a necessity. Brompton Hospital experience with oleothorax was favourable, and fistula might be cured by this method.

THE CASE FOR EUGENICS

POPULAR LECTURE BY LORD HORDER

The Popular Lecture, at the close of the Melbourne Meeting of the British Medical Association, was delivered on September 13th by Lord Horder, who took as his subject "The Case for Eugenics." As president of the Eugenics Society he found a special pleasure in addressing an Australian audience on that subject, because an Australian stockbreeder, Henry Twitchin, whose interest in eugenics was derived from his breeding of farm animals, gave £1,000 annually to the British society for several years before his death, and bequeathed it the residue of his estate, whereby the amount of that donation was increased threefold.

Lord Horder defined eugenics, in the words of Francis Galton, as the study of agencies under social control which may improve or impair the racial qualities of future generations, either physically or mentally. While fully appreciative of the various efforts made for social reform and human betterment in our day, he held that the economic advantages, using the term in its widest sense, lay with the efforts towards racial improvement rather than with social service in a particular generation. Eugenics had no quarrel with the principle underlying social and environmental reform, but he could not help observing that a good deal of such reform was no more than tinkering with the situation. The eugenic student was more humanist than humanitarian in his outlook. He did not believe that permanent results would accrue from pampering the individual. He held that the greatest service that one human being could render his kind was to do his utmost to see that every new life was started on as sound and sturdy a basis as possible. With an annual bill for social services in England and Wales of some four hundred million, the fact remained that one person out of ten was too dull or unworthy to be absorbed into industry, one out of 120 was mentally defective, and one out of 300 certified as insane. The secret of the trouble was that heredity had been forgotten, and that heredity if it did not work for us worked against us. In concentrating upon nurture, nature had been neglected. Preventive medicine had turned attention to the child, the infant, even the pre-natal life; but it was necessary to go back further still, for with conception there was stamped upon the future individual either the power to live healthily or the burden of handicaps from which, whatever subsequent care was lavished upon him, he might never be free. Eugenics was by far the most profitable field of preventive medicine. Civilization had advanced far enough for biological control to be achieved, just as completely as physical control had been achieved already. Admittedly the knowledge of human genetics was meagre, but there must be a mass of unascertained facts which would prove of enormous value if they were available, and though the same methods could not be employed in the study of human beings as in animals or plants, there were definite reasons for believing that the same basic laws operated throughout the biological field.

Possible Applications of the Eugenic Principle

The lecturer made certain suggestions for action on the main principle of eugenics, supposing this to be accepted. The study of genetics should be encouraged in the universities and schools; scholarships and research studentships should be instituted; genetics should be taught to medical students, a place being made for it if necessary by omitting something of far less importance from the pre-clinical subjects—for example, from physiology—the compilation of family pedigrees should be encouraged, also the use of pre-marital schedules of health. It should be possible for men and women of marriageable age to produce, if not a pedigree, at least a statement, kept up to date, of their physical and mental fitness. A "family conscience" should be cultivated to counteract the selfishness of the childless marriage when both partners were healthy, and the "tender-mindedness" of women who refused to brace themselves to fulfil the supreme function. If the monetary position of possible parents was a real, and not merely a selfish, bar they should be helped indirectly by remission of taxation or directly by family subsidies.

Finally, Lord Horder spoke of eugenic principles as having a negative as well as a positive aspect; indeed, it was negative eugenics which had attracted a disproportionate attention, partly because attainment was easier, more immediate, and entailed much less sacrifice. There were at present two practical examples of negative eugenics. The first was the sterilization of the unfit. Here the official view of the Eugenics Society was that the greater hope of inculcating a eugenic conscience lay along the path of voluntary rather than enforced sterilization; a strong and representative committee was at present working on a Bill in Parliament to implement the recommendations of the Brock Committee. The other form of practical negative eugenics was birth control, or, more properly, conception control (though it was unlikely that the more accurate term would now replace the other). That birth control had come to stay seemed certain, but that there was no method as yet which was free from some disadvantage, either on physiological or aesthetic grounds, or simply on account of unreliability, was equally certain. Unfortunately, the practice of birth control had acted dysgenically during the last fifty years, because it had been largely confined to persons of superior biological endowment, and had not been practised by those who needed most some means whereby the births of their children could be spaced—and the spacing of births was the only proper use to which the practice of contraception should be put. Instruction in these methods should be provided by local authorities under medical supervision in properly organized clinics, and the instruction should not be confined merely to women whose lives would be in danger from further confinements or those suffering from gynaecological diseases.

The aim of eugenics was to study the laws of heredity as applied to human beings, so as to improve the physical and mental quality of the race. Men and women who accepted the serious responsibility of parenthood must be free from disease and defect which might be transmissible by heredity, but at present it was among the fittest stocks that the birth rate was lowest and among the unfit that it was highest. Which only demonstrated the need for the inculcation of eugenic wisdom.

WAR AND PEACE

A MANIFESTO BY PSYCHIATRISTS

We have received from Dr. J. Roorda, honorary secretary of the Netherlands Medical Association, a copy of the following letter which has been addressed "to the Statesmen of the World." It is signed by 350 psychiatrists and psychologists of various nations.

We psychiatrists, whose duty it is to investigate the normal and diseased mind, and to serve mankind with our knowledge, feel impelled to address a serious word to you in our quality of physicians.

It seems to us that there is in the world a mentality which entails grave dangers to mankind, leading, as it may, to an evident war psychosis. War means that all destructive forces are set loose by mankind against itself. War means the annihilation of mankind by technical science. As in all things human, psychological factors play a very important part in the complicated problem of war. If war is to be prevented the nations and their leaders must understand their own attitude towards war. By self-knowledge a world calamity may be prevented. Therefore we draw your attention to the following:

1. There is a seeming contradiction between the conscious individual aversion to war and the collective preparedness to wage war. This is explained by the fact that the behaviour, the feelings, the thoughts of an independent individual are quite different from those of a man who forms part of a collective whole. Civilized twentieth century man still possesses strong, fierce, and destructive instincts, which have not been sublimated, or only partly so, and which break

loose as soon as the community to which he belongs feels itself threatened by danger. The unconscious desire to give rein to the primitive instinct not only without punishment but even with reward, furthers in a great measure the preparedness for war. It should be realized that the fighting instinct, if well directed, gives energy for much that is good and beautiful. But the same instinct may create chaos if it breaks loose from all restraint, making use of the greatest discoveries of the human intellect.

2. It is appalling to see how little the peoples are alive to reality. The popular ideas of war as they find expression in full-dress uniforms, military display, etc., are no longer in keeping with the realities of war itself. The apathy with regard to the actions and intrigues of the international traffic in arms is surprising to anyone who realizes the dangers into which this traffic threatens to lead them. It should be realized that it is foolish to suffer certain groups of persons to derive personal profit from the death of millions of men. We come to you with the urgent advice to arouse the nations to the realization of fact and the sense of collective self-preservation, these powerful instincts being the strongest allies for the elimination of war. The heightening of the moral and religious sense in your people tends to the same end.

3. From the utterances of well-known statesmen it has repeatedly been evident that many of them have conceptions of war that are identical with those of the average man. Arguments such as "war is the supreme court of appeal" and "war is the necessary outcome of Darwin's theory" are erroneous and dangerous, in view of the realities of modern warfare. They camouflage a primitive craving for power and are meant to stimulate the preparedness for war among the speaker's countrymen. The suggestive force of speeches made by leading statesmen is enormous, and may be dangerous. The warlike spirit, so easily aroused by the cry that the country is in danger, is not to be bridled, as was evident in 1914. Peoples, as well as individuals, under the influence of suggestions like these, may become neurotic. They may be carried away by hallucinations and delusions, thus involving themselves in adventures perilous to their own and other nations' safety.

We psychiatrists declare that our science is sufficiently advanced for us to distinguish between real, pretended, and unconscious motives, even in statesmen. The desire to disguise national militarism by continual talk about peace will not protect political leaders from the judgement of history. The secret promoters of militarism are responsible for the boundless misery which a new war is sure to bring. International organization is now sufficiently advanced to enable statesmen to prevent war by concerted action. Protestation of peace and the desire for peace, however sincere, do not guarantee the self-denying spirit necessary for the maintenance of peace, even at the cost of national sacrifice. If any statesmen should think that the apparatus to ensure peace is as yet insufficiently organized, we advise them to devote to this purpose as much energy and as much money as is now being expended on the armaments of the various countries.

We cannot close without expressing our admiration of those statesmen who show by their actions that their culture and morality are so far advanced that they can lead peoples to a strong organization of peace. In our opinion they alone are truly qualified to act as the leaders of nations.

The directory of the Private Practitioners' Association, which is supplied post free on application to medical practitioners, contains a list of the names and addresses of persons qualified to give massage, medical gymnastics, medical electricity, and other forms of physical therapy in the various parts of the country. Those holding the biophysical assistants' diploma of the Society of Apothecaries are specially designated. All the members of this association are also members of the Chartered Society of Massage and Medical Gymnastics, and work only under the direction of registered medical practitioners. The special forms of treatment which each can undertake are shown in the directory, applications for which should be addressed to the honorary secretary, Mr. J. Stewart Brown, 2, Grove Place, Falmouth.

OPENING OF NEW SESSION

Autumn Dinners

ST. THOMAS'S HOSPITAL

St. Thomas's Hospital Old Students' Dinner was held on October 4th at the Dorchester Hotel, Sir Cuthbert Wallace being in the chair. Following a precedent established two years ago speeches were curtailed, with the result that ample opportunity was given at the end of the dinner for the renewal of old acquaintanceships and for general conversation. The measure was a popular one, and the dinner was adjudged to be most successful in every way.

After the toast of "The King" had been drunk, the chairman proposed "St. Thomas's Hospital and Medical School." The Treasurer, Sir Arthur Stanley, replying for the hospital, offered his congratulations to Sir Cuthbert Wallace on his election as President of the Royal College of Surgeons. Reviewing the progress of the year, he said that reconstruction of the out-patient department had been completed and the department was now as good as it could be with the space at their disposal: it had been possible to do the whole of the work without calling upon the hospital funds at all. High tribute should justly be paid to Colonel Irwin, secretary of the hospital, Mr. Currie, the architect, and to the staff, particularly to Mr. Maybury. As for the hospital itself they had been remodelling the wards, and only two remained to be done. Further, they had done their best to improve the amenities of College House. This had not been easy, because whereas the personnel of College House used to be seventeen, it now amounted to thirty-one. A verandah had now been built, made almost entirely of glass; this could, added Sir Arthur, amid laughter, easily be replaced at the expense of those who broke it. He then referred to Lady Riddell's generous gift towards the erection of a Nurses' Home, which would, incidentally, facilitate the improvement of accommodation for paying patients. He would like to point out, however, that despite this generous gift, and those of Lord Nuffield, Lady Houston, and others, the hospital was not rich.

Professor L. S. Dudgeon, replying as Dean of the Medical School, also congratulated Sir Cuthbert Wallace on his honour, and expressed a hope that his position might enable some co-operation to be exercised between the College and the Medical School. He announced with regret the retirement of the senior surgeon, Mr. Cyril Nitch, who left with the regrets of all. One of the deaths during the year was that of Dr. Grabham, who had entered the medical school as long ago as 1858: he had later had a big practice in Madeira, of which he was uncrowned king. Amongst the honours were Professor Le Gros Clark's appointment to the Chair of Anatomy at Oxford and his Fellowship of the Royal Society. Martin Huggins was now Prime Minister of Southern Rhodesia, and Dr. W. D. Johnson, Director of Medical Services at Lagos, had been knighted for services in Africa, especially for his work on tropical hygiene. As regards the medical school it had always been said that there could be no further building. However, Professor Appleton considered that *x*-ray equipment was essential in the anatomy department, and this had been installed. Research rooms had also been built. These additions would be of considerable benefit to students. Those in charge of the anatomy department seemed, he added, to show an almost surgical flair for exhausting the treasury. Dealing with the scheme for co-operation with Bart's and Guy's, Professor Dudgeon said that progress had been slow, though Mr. Max Page had conducted the surgical unit at Bart's for a fortnight. The health of the guests was then proposed.

In reply, Professor T. B. Johnston, Dean of Guy's Hospital Medical School, made a witty speech in which dietetics, the hospital corridor, haggis, toothless senility,

and the reproductive activities of starlings and pigeons all had a place. He welcomed the co-operation between the two hospitals, and was glad to feel that after the break in 1825 they were still able to "carry on." Dr. A. E. Russell, proposing the toast of "The Chairman," paid a special tribute to Sir Cuthbert Wallace's operative skill and to his activities as Dean and Director of the surgical unit. Sir Cuthbert briefly replied.

KING'S COLLEGE HOSPITAL

The annual dinner of the past and present students of King's College Hospital was held on October 5th at the May Fair Hotel, with Sir Charlton Briscoe in the chair. At the dinner Dr. G. F. Still, consulting physician and professor emeritus for diseases of children to King's College Hospital, was presented by the chairman with a book containing the names of subscribers to the fund which was collected for his portrait and which had been exhibited in this year's Academy. Owing to the generosity of the artist, Mr. Gerald Kelly, the proceeds of the fund are to be devoted to an endowment of a cot in the children's ward of the hospital.

In proposing the toast of "The Hospital and Medical School" the chairman referred to the great loss the hospital had sustained in the resignation of the Duke of Connaught from the presidency of the hospital. He said, however, that the hospital was fortunate in that the Duke of York had graciously consented to become the new president. In welcoming the guests he made a special reference to the members of the Rugby football and hockey clubs, who were present as guests of the medical school. They had done some particularly brilliant work in the past year on the athletic field, and everybody was looking to them to do even better this coming year. The dean, Dr. J. A. Drake, in his reply to the toast, mentioned that the medical school was more flourishing than it had ever been, and he was pleased to report the opening of a new and fully equipped biochemical laboratory. He made a special reference to the recently published book, *King's and Some King's Men*, by Dr. H. Willoughby Lyle, dean emeritus of the medical school, which contains a wealth of information about everything and everybody who has had anything to do with King's.

Dr. G. F. Still, in thanking the company for the gift book containing the names of subscribers to his portrait fund, confessed that it was only when sitting for the portrait by Mr. Gerald Kelly that he realized how strenuous was the life of an artist's model, and what patience and attention to detail was required of the artist. Dr. R. H. Lee, in proposing the health of the chairman, told the company some entertaining stories of the past, when Sir Charlton Briscoe was a student and house-surgeon. After this the formal proceedings of the evening ended.

CHARING CROSS HOSPITAL

The annual dinner of the Charing Cross Hospital Medical School was held at the Café Royal on October 5th, with the senior surgeon, Mr. Norman C. Lake, in the chair. The large company included a number of medical women, old students of the hospital.

After the King's health had been honoured, Mr. Lake proposed the toast of "The Hospital and Medical School," explaining that he was merely a "substitute chairman" for their old friend Dr. A. W. Oxford, who now had further eye trouble. Dr. Oxford, said Mr. Lake, was one of the most remarkable alumni of Charing Cross Hospital: a Doctor of Divinity and of Medicine, who entered as a medical student when he was already a Governor of the hospital, an erudite antiquarian, a philanthropist, and a versatile contributor to knowledge whose writings ranged from the anatomy of the foot to the history of Fountains Abbey. At the chairman's suggestion a message of sympathy and good wishes for his recovery was sent to Dr. Oxford. Instead of giving the usual brief review of the activities of the past year Mr. Lake preferred to take a look into the future. It had been found that the old Nurses' Home could not be converted into a private patients' block without pulling it down. Soon they would have to face the problem of entirely rebuilding the hospital either on its present site or elsewhere. "With a name like Charing Cross we are very much tied to the district." The forthcoming revision of the curriculum would raise a further problem in the near future, and momentous decisions for the hospital and its school would have to be taken. More accommodation might be needed, and if they could not find this on the old site they would have to seek it elsewhere.

The Dean, Mr. Eric A. Crook, in reply to the toast, said that Charing Cross Hospital Medical School, now in its centenary year, was a "happy ship"; this was partly because every student came across every member of the staff at some part of his training, and also perhaps because the members of the visiting staff were relatively young in years. There was a friendly spirit of helpfulness all round. After paying tribute to the memory of Dr. Aidie and Dr. Howard Jones, Mr. Crook congratulated Mr. Carter Brain on having been present at the dinner every year since 1882. Mr. Jennings Marshall, in proposing the chairman's health, spoke of their long friendship and the personal debt he owed to Mr. Lake, who in a brief reply said that his friendship with Mr. Marshall had even withstood co-authorship of a textbook.

Dr. Gordon Holmes, who proposed the toast of "The Visitors," paid a regretful farewell to Professor D. M. Blair, and congratulated him on his appointment to the Glasgow Chair of Anatomy. Professor Blair, in reply, said that he was grateful to Charing Cross for many things during his past eight years at King's College, and would carry with him pleasant memories of its students and staff. He hoped the friendship between King's and Charing Cross would long continue. Mr. Stoneham, solicitor to the hospital, who also replied for the guests, told some amusing stories of members of the hospital staff with whom he had been on a cruise in the *Voltaire*.

Scotland

National Health Insurance in Scotland

The annual conference of the Scottish Association of Insurance Committees was held in Perth on October 4th and 5th. Provost R. B. Dyer of Stranraer, in his presidential address, said that the Highlands and Islands Scheme, which had done a great deal for the health of this part of Scotland, had been a direct outcome of the National Health Insurance Act. There was now hardly a parish in the Highlands which was not provided with the services of a fully trained nurse, while the medical service was immeasurably better than it had been a generation ago. There was still much ill-health among the working population which could be avoided, and it seemed that the time had arrived when they should consider whether all the separate health services, developed in response to popular demands, should not be linked more closely together. The conference passed a resolution that the Government should be urged to make dental and optical benefits statutory benefits under the National Health Insurance Act, and another resolution urging an inquiry into the possibility of making hospital treatment for insured persons and their dependants also a statutory benefit.

At the closing meeting of the conference, Dr. R. W. Craig, Scottish Secretary of the British Medical Association, delivered an address in which he said that the fault of present-day medical services was the absence of satisfactory co-ordination throughout the country. Those responsible for the health services had good reason for being satisfied with the improvement that had taken

place in the general standard of health of the community, but it was a matter for anxiety that the maternal death rate tended to increase rather than diminish, the Scottish rate at present standing at a level of approximately 6 per 1,000. It could be confidently stated that the theoretical side of midwifery was most efficiently taught in the medical schools ; the practical side was also excellent so far as it went, although sometimes medical students did not have sufficient practical experience to enable them to deal efficiently with a difficult case. There was another side to the question, however, for if the midwife and the medical student required more practical education, this applied equally to the patient, her relatives, and friends. Unfortunately there was a growing tendency on the part of the public to think that the cleverest doctor was the one who could get the disagreeable business of labour finished in the shortest possible time. It had been suggested that all maternity cases should be attended by specialists and delivered in hospital, but that was impracticable, and even if it were practicable it would not be advisable. Maternal mortality was not attributable to any one clearly defined factor. In Berlin nearly 69 per cent. of the maternal deaths occurred in hospitals, and yet the maternal death rate was as high as that in this country. This fact was an overwhelming proof that midwifery could be carried out safely at home. There were, however, certain complications which could be efficiently treated only in hospital, so that adequate hospital provision was desirable in all areas. Referring to the remuneration of doctors in maternity cases, Dr. Craig said that this exacting part of the work of general practitioners was often the most poorly paid. This prejudiced the standard of the service, because under existing conditions the doctor's attendance was often wholly unremunerated.

Presentation to Duns Doctor

Dr. John MacWatt, Morelands, Duns, who retired from practice last June, was made the recipient of a handsome presentation on September 20th. Dr. MacWatt, who graduated M.B. at Edinburgh in 1878, had been in practice at Duns for over fifty years ; he had also been medical officer of health for the burgh of Duns, and police surgeon and medical officer for several parishes of Berwickshire. The presentation, which was made by a small deputation of patients and other residents in the district, took the form of a cheque for £500 and a book containing an expression of appreciation of Dr. MacWatt's services to the community.

England and Wales

Overcrowding and Maternal Mortality

In a speech at Sheffield on October 4th the Minister of Health, Sir Kingsley Wood, foreshadowed a campaign against overcrowding. He described the problem as being of equal importance with that of slum clearance, on which almost every local authority had responded to the call. To deal with overcrowding would require careful and judicial administration, but it was worth doing, for what was the good of spending money on new houses and in endeavouring to stamp out disease when a fertile cause of ill-health was allowed to remain? As the first step in the campaign he was going to ask local authorities to make a survey of overcrowding in their districts and to prepare programmes for dealing with it. Sir Kingsley Wood also announced that he would tackle the problem of maternal mortality, " the great blot on public health administration." Arrangements were in hand for examinations to be made by medical men in the areas where the death rate was particularly high, and other examinations would be made in districts where the rate was very low, for the purpose of comparison.

Leeds Housing Schemes

Lord Halifax inaugurated on September 30th the first public utility housing scheme at Leeds by opening a block of forty-one flats on a former slum site in East Street. These flats have been erected at a cost of £23,000 by the Leeds Housing Trust, a non-political and philanthropic organization. The creation of this trust had been followed by the institution by the city council of a five-years plan of housing. In his annual report for 1934 Dr. J. Johnstone Jervis, medical officer of health, gives an account of what is being attempted. The year under review was the first of this five-years programme, and 4,169 new houses were built. The total number of houses, including flats, built by the city council since 1921 is 11,008, and the number erected by private enterprise is 17,829, most of the latter being of the larger villa or semi-villa type, the city council concentrating more particularly on dwellings for the working classes. The number of applicants for new houses at December 31st, 1934, was 5,166, and it has been necessary to close the lists for all except the larger parlour type of house. Dr. Jervis deplores this, for overcrowding in the poorer parts of the city is still fairly prevalent, and where that overcrowding is aggravated by the presence of disease such as tuberculosis the need for alleviation becomes urgent. He states that nothing has been more striking during the past year than the unfavourable mortality statistics which have characterized almost every area declared as unhealthy. With the disappearance of these bad areas he anticipates an immense improvement in the health figures locally and in those of the city as a whole. Dr. Jervis refers to the establishment in August, 1934, of a special disinfesting station for bug-infested furniture and other household effects. In no single case where the tenant has gone into a new house after eradication of pests has there been any infestation, although this had previously been a common occurrence. The agent used for the destruction of insects was hydrogen cyanide.

The Hunterian Society Programme

The Hunterian Society's programme for 1935–6 opens on Monday, October 14th, at 7.15 p.m., when a dinner meeting will be held at Simpson's Restaurant, Cheapside, and Dr. W. B. Brander will deliver his presidential address on " The Challenge of the Chronic Sick." On November 18th, at 9 p.m., at the Cutlers' Hall, Warwick Lane, a debate on the proposition " That Birth Control is Unnecessary in Modern Life " will be opened by the Bishop of St. Albans, Dr. C. P. Blacker, Dr. Halliday Sutherland, and Dr. E. R. T. Clarkson. At Simpson's Restaurant on December 16th, at 7.15 p.m., Dr. J. A. H. Brincker and Dr. Lennox Wainwright will open a discussion on " Measles." The Hunterian Lecture on " The Physical Basis of Psychoneurosis " will be delivered by Dr. Sven Ingvar, professor of medicine in the University of Lund, at the Mansion House, on January 20th, at 9 p.m. The annual dinner of the society will be held at the May Fair Hotel on February 13th ; and on February 24th, at 9 p.m., at the Mansion House, Sir G. Lenthal Cheatle will deliver the Hunterian Oration on " John Hunter's Time and Our Own Times." On March 16th, at 7.15 p.m., at Simpson's Restaurant, Dr. Adolphe Abrahams, Dr. C. S. Myers, F.R.S., and Dr. J. C. Bridge will open a discussion on " Fatigue."

Municipal Housing at Wednesbury

The two thousandth house under the Wednesbury municipal housing scheme was opened by the chairman of the Health and Housing Committee on September 26th. This Staffordshire borough, with a population of only 32,000, has a commendable record for slum clearance and municipal housing. A souvenir booklet issued for the occasion reproduces side by side photographs of the ugly sites which have been cleared and the pleasant estates to which the tenants have been removed. The 2,000 houses are of various types, including single-bedroom bungalows

for old persons, maisonettes or small flats, non-parlour and parlour houses, and houses to which a small shop is attached. Shrubberies and lawns have been laid out at various points, the principal roads have been margined with grass, garden space has been allotted at the front and back of the houses, and recreation facilities have been provided. The corporation owns about one-third of the area of the borough and about one-quarter of the houses, and under the stimulus of the Housing Act, 1930, more than one house is being completed per day. Out of 7,600 houses existing in the borough in 1933, 1,250 will have been demolished before another two years have passed. Under the Housing Act of 1935 it is hoped to provide further accommodation to meet cases of overcrowding.

Memorial to Miss Davies-Colley

At the suggestion of several patients and friends, a memorial is being raised to the late Eleanor Davies-Colley, M.D., F.R.C.S., of whom an obituary notice appeared in these columns on December 22nd, 1934. Donations may be sent to the honorary treasurer, Miss Chadburn, C.B.E., M.D., B.S., 16, Harley Street, W.1. Cheques should be crossed "Westminster Bank Ltd., Marylebone Branch." The sum raised will be used mainly for the benefit of the South London Hospital.

Reports of Societies

CHEMOTHERAPY OF PROTOZOAL AND BACTERIAL DISEASE

At the meeting of the Section of Tropical Diseases and Parasitology of the Royal Society of Medicine on October 3rd, with Dr. P. H. Manson-Bahr presiding, a lecture on the chemotherapy of infectious diseases caused by protozoa and bacteria was given by Professor H. Hörlein of Düsseldorf Academy of Medicine, well known for his work on the barbituric group of drugs and as the introducer of luminal.

Protozoal Diseases

Professor Hörlein began by saying that the possibility of combating infectious diseases with chemotherapeutically active substances depended to a large extent on the structure of the pathogenic organism. Apart from the cure of contagious pleuropneumonia in horses with neosalvarsan, there was as yet no chemotherapeutic substance which was active in virus diseases. The position was scarcely better with bacterial infections due to cocci and bacilli. These two types of infective agents occupied the lowest level in the scale of micro-organisms. On the other hand, the spirochaetes, which also belonged to the bacteria group, and, still more so, those causal organisms belonging to the protozoa, represented relatively highly differentiated species, and the more highly developed a pathogenic organism was, the more points for attack it appeared to offer to the action of chemotherapeutic substances. It was therefore not to be wondered at that the best results with chemotherapeutically active substances had been obtained in spirochaetal diseases, such as syphilis, relapsing fever, and framboesia, and above all in protozoal diseases. There was scarcely a protozoal disease of man which could not be cured nowadays by early treatment with the appropriate synthetic drug. He instanced sleeping sickness, malaria, amoebic dysentery and leishmaniasis. Epizootics resembling human diseases, as, for example, trypanoses, were also relatively easily dealt with by the same drugs as had been found of value in the treatment of disease in man. On the other hand there had been a lack of success up to the present in the treatment of those diseases of animals which were not generally related to the tropical diseases of man. The most important of these epizootics were the piroplasmoses, which were caused by babesiae and theileriae, and were found not only in tropical and subtropical regions, but also in temperate zones. No species of domestic animal was spared by these diseases, but there were several difficulties in finding a substance which had a direct action against the piroplasmoses. A large number of subspecies of piroplasmoses existed, and owing to specific differences they were not all therapeutically influenced to the same extent and in the same way. Mixed infections of several subspecies of piroplasmoses often occurred in the same animal. He reviewed briefly the chemotherapy of the piroplasmoses during the last twenty-five years. There was a tendency to look upon these conditions as forms of animal malaria, and repeated attempts at treatment with quinine had been made; but the organisms concerned were unrelated to the malaria organisms. As a result of the knowledge gained by Nuttall and his collaborators, trypan-blue found a good deal of favour, but the large number of substances in addition to trypan-blue which were tried suggested that this preparation must have serious defects. In fact it had only a small sphere of therapeutic action. In mixed infections it was of avail against babesiasis, but not against theileriasis. Nor could a complete cure in any event be obtained with trypan-blue; all that happened was that an active infection was converted into a latent form. Afterwards trypaflavine was introduced. This had a larger field of therapeutic action, and its action was more intensive, but in spite of this it was not entirely satisfactory, apart from the fact that it was negative in theileriasis. The necessity of administering it intravenously also militated against its employment.

Lately a new remedy against piroplasmosis named acaprin had been brought out at Elberfeld, and was free from the above disadvantages. It had been tried out on the broadest lines upon domestic animals and under varying conditions in several countries, and the reports showed that it might be regarded as a specific remedy for nearly all forms of piroplasmosis. Good results had been recorded in the case of dogs, cattle, horses, sheep, and swine. It could be administered subcutaneously, intramuscularly, intravenously, or perorally. There was no staining of the tissues, which was such a disadvantage with trypan-blue. Investigations showed that in toxic doses it gave rise to an excitation of the parasympathetic nervous system in experimental animals, but the symptoms of shock generally passed off within about two hours, and the therapeutic action was not impaired by these toxic effects.

Bacterial Diseases

Turning to the chemotherapy of bacterial diseases, Professor Hörlein said that until lately this had not advanced beyond certain initial successes, and a deplorable pessimism seemed to have settled down on this field of work. The phenols and other derivatives showed great activity against organisms *in vitro*, but in the body they had no more than a local effect. A new class of substances of the sulphonic acid series with a distinct chemotherapeutic action in streptococcal infections had just been elaborated at Elberfeld under the names of prontosil and prontosil S. When given in large quantities the dye penetrated into all the tissues, and had a potent action on streptococci localized in various situations in the body. So far it had not been possible to demonstrate microscopically any large accumulations of the dye in particular organs or cells. It displayed an almost selective action for streptococcal infections of mice and rabbits. Whether it acted directly or indirectly on the organisms was not yet known. It had no particular action on streptococci *in vitro*, and acted only in the living body. It had some action also in staphylococcal infections. In clinical practice it had proved efficacious in scarlet fever and in certain forms of arthritis, but there had not yet been an opportunity of testing it in rheumatoid arthritis. Professor Hörlein concluded with the remark that further advances in the treatment of protozoal infections were almost certainly imminent, and a breach had also been made in the ramparts of bacterial diseases.

General Discussion

Dr. Manson-Bahr, from the chair, considered that what had been brought forward that evening constituted a milestone in chemotherapy. It appeared to offer a means of combating those streptococcal infections with

which clinicians and pathologists were faced every day of their lives, and Professor Hörlein was certainly in the vanguard of chemotherapeutic discovery. He might perhaps be permitted to recall one brief passage of unpublished history. The late Sir Patrick Manson deserved the title in some respects of father of chemotherapy. In the early 'eighties, during a quinine famine in Hong-Kong, Manson used methylene-blue in the treatment of malaria; this had been shown to have a certain low specific action on the plasmodia. Manson was the first man to be able to demonstrate a methylene-blue stain in the plasmodia—a stain which he afterwards elaborated into that known as borax methylene-blue. It was Manson's idea that these particular dyes which had an affinity for the parasites would prove of therapeutic value, and that led up to Nuttall's work on trypan-blue. It was a great gratification to the speaker, on entering the German laboratory at Nazareth at the end of the war, to find in that ransacked place one unbroken bottle on the bench—a bottle of Manson's stain which the Germans on their side of the line had found advantageous in staining malarial parasites.

The subsequent discussion, in which Dr. Moreland McCrea, Dr. Anwyl Davies, Dr. A. H. Douthwaite, and others participated, chiefly took the form of questions addressed to the lecturer on the new preparations he had mentioned. He replied that it was only nine months since the prontosil series had been liberated for clinical use, and only eleven papers as yet had been published on the subject in Germany. During the last six months Sir Henry Dale had been working on prontosil at Hampstead. About one thousand patients had been treated in Germany for streptococcal infections by means of this preparation, so far without visible signs of toxic reaction. The new drug had been tried in puerperal septicaemia, and there some of the best results had been obtained, though it was found desirable to give anti-streptococcal serum, at least in the preliminary experiments. Asked as to the objective effects of administering the drug, Professor Hörlein said that the temperature came down immediately after the oral administration of prontosil, and if afterwards the symptoms reappeared they yielded again to a further administration. The same dose was repeated each time, and there was no cumulative effect. Coloration appeared in the urine half an hour after administration, and the drug was completely eliminated from the body within an hour.

Although the discussion was principally on the possibilities of prontosil in streptococcal infections, the other preparation mentioned, acaprin, aroused some interest from the veterinarian point of view. Mr. J. T. Edwards, a veterinary surgeon, said that it seemed to him that the elaboration of acaprin was the most outstanding contribution to veterinary therapeutics since the discovery of trypan-blue in the treatment of the piroplasmoses. Although since Nuttall's discovery veterinarians had had a great weapon for the treatment of tropical piroplasmosis in cattle, that remedy had proved completely ineffective in the treatment of British red-water caused by *Babesia bovis*. Until recently veterinary science had been completely nonplussed by this infection. A remedy introduced a little previously to acaprin was a bismuth derivative named todorit, for which good results were claimed, but it seemed that this new discovery from Elberfeld was a great advance on anything hitherto available. In view of the fact that thelieriasis was a most widely fatal condition for British cattle imported into India, an effective remedy would have very great economic value.

CORRESPONDENCE

R.M.B.F. Christmas Appeal

Sir,—A part of the work of the Royal Medical Benevolent Fund which has won the very special sympathy and support of many of your readers in previous years is the distribution of Christmas gifts. Undoubtedly it is due to the fact that this particular appeal touches the heart and kindly feelings of all as it comes at the season of good-fellowship. Once again I venture to make my appeal in your columns for donations, either large or small, in order that the Fund may continue the distribution of 30s. each to all beneficiaries.

I cannot but feel impressed when I read the many letters of thanks which are received from the recipients after Christmas Day. Clearly these letters are written from homes where no luxuries exist and where the greatest economy has to be studied, often from cheap lodgings or single bed-sitting rooms, where lonely ones rejoice in the fact that they have not been forgotten. But all the letters contain expressions of the greatest gratitude and thanks to those who have made the gift possible.

I do not wish to stress unduly the needs and difficulties of our less fortunate medical brethren or of those who were once near and dear to them. But I do desire to assure your readers of the great work the Benevolent Fund is doing in bringing some happiness and comfort into the lives of many. This kindly work is being carried on thanks to the generous support which the Committee has received, but it can only be continued and increased if we still have the support and sympathy of our professional colleagues. Donations should be sent, and cheques made payable, to the Honorary Treasurer, Royal Medical Benevolent Fund, 11, Chandos Street, Cavendish Square, London, W.1, who will gratefully acknowledge them.—I am, etc.,

Thomas Barlow,
President.

October 7th.

Injuries to the Semilunar Cartilages

Sir,—I have just read an article on injuries to the semilunar cartilages by Mr. Charles A. Pannett, published in your issue of September 7th. I am reviewing this subject, and have come to England partly for this purpose. I think certain features of this article call for comment:

1. The statement is made that locking is absent in posterior horn lesions of the mesial cartilage. I have found it to be just as frequent in these as in any other lesions. Furthermore, in 1923 I reviewed all the semilunar literature to date and never saw such a statement as the above. In the current year I reviewed all the literature from 1923 through 1934. I have seen no such statement in this review either. For these reasons I should suggest that the author, when he makes such an unusual statement, should add that there is some disagreement on the subject.

2. The statement is made that it is not possible to excise the whole cartilage through the anterior incision. I have often found this to be the case, but I have been able to excise the whole cartilage anteriorly time and time again, and so has every other operator whom I have spoken to on this point. I think Mr. Pannett's stand against pulling and hauling on the posterior horn is very well taken, and I do not hesitate to make a postero-mesial incision to avoid traumatizing.

3. The statement is made that it is sufficient in bucket-handle lesions to excise the handle if the periphery is intact. This is obviously a fact, but I feel that it is impossible to tell whether the periphery is intact or not. Mr. Pannett's case required reoperation because of a peripheral lesion which was not apparent at the first operation; this sequence has happened so often on my side of the water that we always excise the periphery with the bucket handle. If this peripheral excision ever caused harm it would be a different matter, but it never does. An expression which used to be current in my

country—that the only good Indian was a dead Indian—can well be paraphrased to apply to the semilunar: if it requires operation it cannot safely be temporized with.

4. The statement is made that the para-patellar incision for exploratory purposes is not justifiable, but no reason is given. Mr. A. G. Timbreli Fisher, in his textbook on internal derangements of the knee, states that this incision is very desirable in certain complicated and anomalous cases. This has been my experience with it, and I have seen no harm from it, except temporary anaesthesia from division of the patellar branch of the long saphenous nerve.

Mr. Fisher's comprehensive textbook also throws light on other points brought up in Mr. Pannett's article: Mr. Pannett states that there is no proof of the inability of a reduced bucket-handle lesion to heal. Mr. Fisher offers convincing experimental proof, as well as clinical, that such lesions when near the concave border show a marked inability to heal.

I might add that I have just had an experience with my own knee in regard to incomplete excision. I had the anterior half of the mesial semilunar excised elsewhere a short time ago without getting freedom from symptoms. I need hardly say that this procedure was contrary to my wish. Very recently I had the residual portion excised here in London, and expect a cure.—I am, etc.,

New York, N.Y., U.S.A., Sept. 29th. JOSEPH KIDDOO SURLS, M.D.

SIR,—Certain statements in an article by Professor Pannett entitled "Injuries to the Semilunar Cartilages" in the *British Medical Journal* of September 7th seem to me to invite criticism. I venture to doubt the wisdom of Professor Pannett's dictum that "when there is a typical 'bucket-handle' tear or a pedicled fragment these separated portions of cartilage may be removed without interference with the rest of the cartilage (provided its attachments are firm) and a successful result obtained." I do not know what views Professor Pannett holds and teaches concerning the causation of the bucket-handle type of lesion, but I have always maintained that (in the case of the internal semilunar cartilage, for example) the inner side of the joint is opened up after preliminary stretching or tearing of the deep fibres of the internal lateral ligament, and the internal semilunar cartilage slips towards the interior of the joint. Then, before it is able to retrace its steps, it is ground between the internal condyles of the femur and tibia and split longitudinally and somewhat obliquely. According to this theory, the tear is preceded by displacement of the *whole* cartilage towards the centre of the joint, and surely, therefore, the peripheral portion of the bucket-handle lesion, however innocuous it may appear, was, in fact, rendered hypermobile by the original accident, and probably remains so for an indefinite period. This presumption is borne out by my personal experience. I have operated upon a large number of bucket-handle lesions of one or other semilunar cartilage and have rarely failed to find this hypermobility of the peripheral fragment, and consequently have never felt justified in leaving it *in situ*.

Similarly, in cases where a pedicled tag is present I used at one time to remove this alone, leaving the rest of the cartilage, and indeed recommended this course in the first edition of my book on *Internal Derangements of the Knee-Joint*. Further experience has convinced me that it is wiser to remove the whole cartilage.

The theory that removal of the whole cartilage unnecessarily weakens the joint is completely contrary to my experience. What occupation could be more strenuous than that of a professional football player? For several years I have made a practice of removing the whole of the cartilage when damaged in this class of patient, and I have not found that the player's game has subsequently deteriorated in any way, even when cases have been followed up for several years. Many of them start kicking a football four or five weeks after the operation. One player scored five goals in his first league game after operation; another ran a hundred yards in ten seconds a few months after. Such cases do not support the theory that the knee-joint is weakened by removal of the whole cartilage!

Moreover, even if the peripheral portion of a bucket-handle lesion remains firmly attached, is it not highly probable that in the case of a person whose occupation or sport is strenuous some subsequent injury may cause this peripheral portion to become detached, thus necessitating further operation? It has fallen to my lot to re-operate upon so many knees which have been previously subjected to incomplete operations upon one or other semilunar cartilage that I have come to the conclusion that these incomplete operations are scarcely ever justifiable. My personal view is that *complete* removal of a torn semilunar cartilage is one of the most satisfactory operations in the whole realm of surgery. I entirely agree with Professor Pannett's dictum that when clear symptoms have been present and the anterior part of the cartilage appears normal on exposure, the posterior end must be examined, and am gratified to find that he recommends (and figures) my method of removal of the whole cartilage by means of a semilunar skin flap, a method which I first used fifteen years ago and have found increasingly valuable.

I have been going through the exhaustive notes that I keep of all my knee cases to see whether my experience coincides with that of Professor Pannett with regard to the absence of locking, which he states to be characteristic of lesions of the back part of a semilunar cartilage. Oddly enough, I find that locking was, in fact, present in fourteen of the last twenty cases of this type of lesion upon which I have operated.

Professor Pannett states that "there does not seem to be any reason to alter the practice of refraining from operating after the primary injury." This is probably a sound rule in the majority of cases, at any rate in the present state of our knowledge. Unfortunately, very little statistical evidence exists as to the percentage of cases of definite semilunar cartilage lesions that remain free from recurrence after conservative treatment of the original injury. My experience leads me to believe that a severe lesion of a semilunar associated with locking becomes recurrent in a high percentage of cases, particularly if the patient leads a strenuous existence. What advice is the surgeon to give, for instance, if a valuable football player is brought to him at the beginning of the season with a locked knee and obvious serious lesion of a semilunar cartilage? Is he to advise conservative treatment which may fail and necessitate operation later, with the result that the player is *hors de combat* for several months, or is he to advise immediate operation, which should enable the player to resume in six to eight weeks? In conclusion, I should like to thank Professor Pannett for his interesting and thought-provoking paper.—I am, etc.,

London, W., Oct. 3rd. A. G. TIMBRELL FISHER.

Diphtheria: Two Questions

SIR,—I think all medical men must at times be confronted by intelligent and well-informed laymen who ask questions which are not readily answered offhand. Two such questions, relating to diphtheria, are in my mind. They may be briefly stated thus:

1. You tell us that in antitoxin you have a remedy which is an almost certain cure for diphtheria provided

it is given in an early stage of the disease. And, further, that if given in a doubtful case, which proves not to be diphtheria, the antitoxin is at any rate harmless. With such a potent remedy in your hands, how comes it that preventive inoculation is required?

2. An antitoxin has been in use for some thirty years; how comes it that, according to the Registrar-General's returns, the death rate from diphtheria has declined no more rapidly than has been the case with measles, scarlet fever, and whooping-cough, for which no specific remedy has been employed? Has antitoxin proved a less efficient remedy than was expected?

I shall be grateful for any suggestions as to how these questions ought to be answered.—I am, etc.,

Leamington Spa, Sept. 16th. R. T. Bowden.

*** These questions are dealt with in an annotation on page 673.—Ed., *B.M.J.*

Puerperal Streptococcal Septicaemia

Sir,—Much publicity has been given this subject in both the medical and the public press. It has been to the disadvantage of both the practitioner and the patient. To the former, because authorities who ought to know better have been pleased to apportion the main share of the blame to him; and to the latter, because young women have developed a fear of motherhood, which is most detrimental to their general health during pregnancy. Statistics on this subject do not, in my opinion, bear out the conclusions their creators seem to draw from them. Perhaps, however, the culprit was discovered before the statistics were completed; and so the general practitioner is blamed by the public and by some of his own brethren.

Most of us in general practice have attended a great number of confinements and, being human, make mistakes. We know in most cases, however, when to apply forceps. Most of us also find that it is not our forceps cases which as a rule become septic, but often the normal easy case, while a difficult forceps delivery under unsuitable and most unhygienic surroundings will have an uneventful puerperium. This leads one to the conclusion that the most probable cause of puerperal septicaemia is "inherent infection" plus "lowered general resistance" of the patient. When a person receives a slight hurt and develops acute osteomyelitis, a slight cold and develops pneumonia, or for some still more obscure reason develops appendicitis, we recognize that the infection is inherent, and that hurt or cold has simply lowered the general resistance, and so brought about the acute illness. Why not recognize these factors more openly in the case of puerperal sepsis? It would be a gracious act if some of our specialists, whom we know and recognize as being much more efficient than we are, would do a little in public to uphold the prestige of the much-maligned practitioner.

I am most grateful to Dr. A. G. C. ffolliott for his most interesting and helpful letter in the *Journal* of August 24th, on the possible use of anti-scarlatinal serum as a prophylactic measure against puerperal streptococcal septicaemia. It seems an excellent idea, as every pregnant woman, no matter how easy her confinement may be, or how well she may have been during her pregnancy, is liable to become septicaemic. Some infection may be lying ready for the turmoil of labour to liberate it, and so precipitate the onset of puerperal sepsis. Would the routine administration of anti-streptococcal serum at the onset of labour not save a great many cases? I would be grateful for advice on this matter, as it seems to at least offer us some hope, and we have already had too much wrong and unhelpful criticism.—I am, etc.,

Clydebank, Oct. 1st. W. D. Allan.

Sensational Publicity for Medical Matters

Sir,—The B.M.A. would surely be rendering a valuable service to the community if, as Dr. W. J. McCardie suggests in your issue of September 28th, it would bring to the notice of the Press Dr. Dain's important resolution regarding the danger of sensational publicity. Probably the editors of lay newspapers have no idea of what damage such emotional notices may cause, otherwise they would surely refrain from publishing them. All anaesthetists, especially those who practised before the days of premedication, must occasionally have come across a patient about to be anaesthetized who, owing to fear, is in a "blue funk," with lips blue, the extremities blue and cold, and the pulse and respiration feeble—a perilous condition which may persist until anaesthesia has been well established and one which calls for especial caution during induction. It is of interest to note that these patients almost invariably give a history of having been frightened by reports of deaths due to anaesthesia.—I am, etc.,

Bristol, Sept. 30th. Arthur L. Flemming.

Complications of Tracheal Intubation

Sir,—I am very grateful to Dr. R. J. Clausen (*Journal*, September 28th, p. 601) for drawing my attention to his case of laryngeal granuloma following intubation. I must beg his pardon for having overlooked it. The fact that this complication has occurred in the hands of one so much more experienced than myself affords me some consolation, however slight it may be.

I was very interested to read Dr. I. W. Magill's comments. Dr. Magill is, of course, a master in all that appertains to anaesthesia, and especially of the technique of intubation, and to have drawn his fire, however devastating, I take as a compliment. On the other hand, I hope I shall not be accused of *lèse-majesté* if I join issue with him on certain particulars. Thus, with reference to the size of tube used, Dr. Magill states that "size 4 is inadequate for the respiratory requirements of an adult woman." This may be so theoretically, but I have never found it to be so in practice. I do not use the method of insufflation, but I have never found respiratory or circulatory distress from the use of a tube of this size. I have breathed through such a tube myself with the nose clipped for some time without any difficulty. Personally, I feel that with the use of a larger tube—even if it be a soft one, and I agree that soft tubes are preferable—the pressure on the delicate mucous membrane of the nose and larynx is greater, and, with it, the liability to trauma. The risk of subsequent sore throat is therefore increased with a larger tube, and I feel that, in spite of the theoretical objections, the use of a smaller tube is justifiable and in most cases adequate.

I note that Dr. Magill prefers the "blind" method, and considers that its use "has proved to be a definite advance in the prevention of trauma." I know that Dr. Magill is an expert at "blind" intubation, and in his hands this may well be so. But is this necessarily true? A blind intubation, neatly carried out, often earns the approbation of one's surgeon; from this point of view it is an effective and spectacular procedure. But I cannot believe that a surgical manipulation carried out blindly is to be recommended for its own sake in preference to visual methods. What would we think of a surgeon who ordered the theatre lights to be extinguished during his operating session? Perhaps this is not a fair comparison, but I do feel that the very spectacular nature of the blind technique often blinds us to its disadvantages. On the other hand, with the aid of the laryngoscope, every movement of the tube can be controlled under

direct vision, and "the risk of injury to tissues" decreased. With the blind technique one cannot guarantee the absence of injury. The risk of trauma with the laryngoscope, properly used, is infinitesimal compared with that which may be produced by friction of the tube against the laryngeal mucosa. Dr. Magill appears to criticize my use of "deep anaesthesia" for intubation. I did not use those words. What I did say was that "it is desirable that intubation should not be attempted until *a sufficient depth* of anaesthesia is reached to ensure that spasm of the glottis, or . . . coughing, will not occur." Certainly I feel that the cords should be well relaxed before intubation is attempted, but this does not necessarily imply very deep anaesthesia. I am sure most surgeons and anaesthetists will agree with Dr. Magill that "the advantages of the method easily outweigh the risks . . . and that, notwithstanding the value of intubation when indicated, the tendency towards wholesale use of the method in every type of case is unjustifiable."

Finally, may I make a small correction to my original article? The time stated therein for the duration of the operation included a period of approximately forty minutes for vaginal examination and preparation, etc., so that the abdominal part of the operation took forty minutes less than would appear from my description.—I am, etc.,

London, W.1, Oct. 5th. R. BLAIR GOULD.

Cardiac Resuscitation

SIR,—I have to thank Dr. Vincent Norman for his remarks upon my paper (*Journal*, September 21st, p. 540), and I also wish to reply to the points raised by him in his letter published on September 28th (p. 601).

Chloroform was used to some extent in all the cases mentioned. Scottish anaesthetists do not trust chloroform as much as Dr. Norman appears to think. In a subsequent paper I hope to show that no one can become an expert with this drug: it is useful in certain fields, but cannot be recommended for routine work. As to the use of adrenaline, I accept, with Dr. Norman, the experimental facts quoted by him, but from actual experience of cardiac puncture it is very difficult to tell when the needle is in the ventricular wall or has passed through it. This is largely due to the toughness of the skin and its grip upon the needle, and also to the relative softness of the cardiac muscle. The recorded successes with adrenaline probably coincide with the successful myocardial injection, the failures corresponding with misplaced solution. Also, what is an "adequate dose" when one has only a one-ounce bottle and a hypodermic syringe? The three-minute allowance does not admit of much time to spare for this proceeding, particularly if it should fail, as is more often the case.—I am, etc.,

Glasgow, Oct. 1st. W. B. PRIMROSE.

Radium Treatment of Naevi

SIR,—I was much interested in reading Dr. N. S. Finzi's paper on the above subject in the *Journal* of September 28th, and admired the most excellent results as shown in the photographs. I notice that this was a post-graduate lecture, and although one can understand that details of technique and dosage are perhaps unnecessary for a post-graduate lecture, for publication purposes the interest of the paper would have been greatly enhanced had he given some details. As Dr. Finzi is one of the leaders of the profession in radium therapy, and as his experience must be unique, perhaps he could see his way to amplify his paper by giving details about technique and dosage for the benefit of those less experienced workers in superficial radium therapy.

I was greatly struck by the long intervals—six months—between the doses of radium for the treatment of cavernous naevi, as this is so very different from my own procedure. It has been my custom to give small doses at intervals of six to eight weeks, filtered through 1 mm. of lead and four layers of lint, taking care never to produce superficial erythema; whereas Dr. Finzi states: "the dose must be such as to produce only a moderate erythema." For cavernous naevi of the raised raspberry type, of moderate dimensions, the results have been extremely satisfactory. In treating cavernous naevi of the scalp by this method I have been astonished that there was little or no loss of hair. I am sure other workers in this field would be indebted to Dr. Finzi for the necessary information.

It is not an uncommon defect in some of the papers in the *Journal* to have bald statements given about treatment of certain conditions without any details. Some considerable time ago (I quite forget the paper) it was stated that *x* rays were very useful in the treatment of erysipelas, but no particulars were given. On another occasion *x* rays were recommended for the treatment of carbuncles, again without details. I quite agree about the value of *x*-ray therapy in both erysipelas and carbuncles, but the technique is all-important. When papers are submitted about treatment for the enlightenment of the profession I think the authors should be asked to supply the necessary details.—I am, etc.,

Glasgow, Oct. 2nd. W. HERBERT BROWN.

Cerebral Haemorrhage and Thrombosis

SIR,—There is a slip in Dr. Fenton's account in the *Journal* of September 28th (p. 601) of a case none the less interesting because belonging to a large group, of which the pathology is still largely conjectural and likely to remain so for a considerable time. In hemiplegia the tongue, on protrusion, is *pushed* over *towards* the paralysed side by the muscles of the other side.—I am, etc.,

The University, Sheffield, Oct. 1st. R. T. COOKE, M.D.

Circumcision

SIR,—I am afraid that I must have earned, in my short time, the disapprobation of a number of your readers, for in my blundering ignorance I have assumed the mantle of a divinity and "shaped the ends" of some thousands of small boys. Yet I am unrepentant, for never have I had a complaint as regards ill after-effects. In view of my own slight experience I should unhesitatingly have any male children of my own circumcised within the first four weeks. The benefit conferred in respect of cleanliness alone is well worth any so-called risk of psychological trauma. I cannot convince myself of the reality of this phenomenon occurring in any child under, say, 5 years of age. I have a distinct recollection of my own circumcision at the age of 2, yet I altogether fail to perceive any gross mental lesion resultant therefrom. No person with any great experience of more or less routine circumcision in all cases of even "tightness" of the prepuce, as distinct from real phimosis, can have failed to appreciate the resultant benefit in the general health and well-being of the children. This was *not* the case in children whose prepuce was merely "well stretched." In almost all my cases when such was done it was later found necessary to circumcise the child, whereupon all trouble ceased. "Bad technique!"

exclaim all the "stretching" experts. No doubt—but the technique was exactly that employed by Dr. D. I. Connolly.

Complications are, in my experience, due in almost all cases to poor nursing and careless mothers, and, even with the poorer classes in Glasgow as out-patients, were notable by their very slight incidence. Haemorrhage need never occur with skill and careful ligation, and in cases where there is any tendency to general oozing I always found that a touch of adrenaline upon the dressing was quite sufficient. I am interested in the theory that the operation may lessen the liability to syphilitic infection. Your letter from the Drs. Lloyd seems to negative this, but I do think it is worthy of full investigation. At present I have twelve "continuous treatment" cases under my care. Of these only four have been circumcised. One can form no valid conclusion from such small figures, but it would be interesting to hear from some hospital authorities or V.D. clinics whether circumcision does, apparently, lessen the risk. —I am, etc.,

H.M.S. *Furious*, Oct. 6th. D. W. Walker, M.B., Ch.B.

Sir,—For many years I have been interested in circumcision as practised both in males and in females in various parts of the world, and in my book to be published soon this essentially "tribal rite," as rightly described, will be fully investigated. When we come to inquire into the origin of this strange custom we meet many difficulties, but certain facts give support to the view that it originated from entirely different motives, such as (1) hygienic and prophylactic (useless, of course); (2) a possible association with phallic worship (and that it is, as we know it to-day, the remains of prehistoric human sacrifice connected with the cult); (3) a sacrifice of a portion to the gods to preserve the rest from harm, a practice well illustrated in other parts of the body; (4) to promote chastity—history supplies examples of its total failure in this respect.

Where did the practice originate? It was not compulsory, except among the priesthood, in ancient Egypt, and there is strong evidence that it was introduced into that country by the negroes. It has been practised in West Africa for over five thousand years, without variation, and to-day the circumcision societies are still in a flourishing condition. It is general among the Jews, who took the custom from either the Babylonians or the negroes, probably the latter. It is untrue to say the spread of the custom in Africa is due to Islam; it existed, of course, thousands of years before Islam. It is interesting to note that during the Roman occupation of Egypt any doctor performing the barbaric operation was executed—a harsh measure, but I believe some punishment should be reserved for those who waste valuable space in medical journals advocating the mutilation.—I am, etc.,

Cairo, Sept. 27th. T. Gerald Garry, M.D.

Hydrogen Peroxide in Ear Disease

Sir,—I am glad to find that Mr. E. B. Waggett (*Journal*, September 28th, p. 601) upholds my main contention that we cannot boast of the therapeutic triumphs of hydrogen peroxide in the treatment of aural discharge, and it is encouraging to know that he advocates cleansing of the tympanum "in preparation for strictly therapeutic measures." Mr. Waggett further supports my condemnation when he admits that "there is no virtue in peroxide when the cavum is known to be free of semi-solid accumulations."

The trouble is that the vast majority are not skilled in intratympanic manipulations, and rely on the faint hope that the simple instillation of peroxide and thumb pumping will—unaided and of their own accord—eventually secure a dry ear. The alleged power of the solution to facilitate, by effervescence alone, the expulsion of solid debris from the tympanus is a very questionable dictum, and to my mind the old story is more acceptable that the effervescence might carry bacteria-laden fluid up to the dark and dangerous attic, aditus, and mastoid antrum.

One cannot deny that Mr. Waggett is justified in using the solution in his own skilled and experienced practice as a preliminary cleansing agent, but the uncontrolled and indiscriminate use of peroxide as a "cure-all" is, in my opinion, a pernicious habit, and strongly to be deprecated. —I am, etc.,

Liverpool, Oct. 3rd. John Roberts.

Control of Tuberculosis

Sir,—In his letter to the *Journal* of September 7th (p. 474) Dr. Gordon Tippett has reopened the problem of child protection against tuberculous contacts. Since separation meets with so many obstacles, and since we are still more or less afraid of protective inoculation, there has been very little specific progress during the past five years. I was therefore pleasantly surprised to find Dr. Gordon Tippett's mentioning of blood plasma as a possible form of treatment.

When I was in Switzerland I had opportunity to study the results of four years' experiments with that method in schools. In some parts, where the incidence of tuberculosis is particularly high, the children receive their blood plasma tablets from their teacher, according to the scheme put forth by the medical officer, to whom regular reports are made and who supervises the individual results. The system involves very little expenditure and seems surprisingly free from risks, as the gratifying results show. I have used blood plasma for several years in suitable cases, and although it is too early to judge the final results, I am convinced that this treatment means at least a step in the right direction. I cannot think of any other method so particularly suited for use in large communities, where the medical officer "would like to do something" yet finds his hands tied from all sides. —I am, etc.,

W. E. R. Mons, M.R.C.S., L.R.C.P.

London, W.1, Oct. 1st.

Lambeth Degrees

Sir,—I have read with great interest "A. H.'s" letter in your issue of October 5th. I, too, have collected various notes about these degrees called "Lambeth." Very few even well-informed people seem aware of the actual procedure or what they really are. I have copies of one or two actual documents. Actually "Lambeth" is a misnomer, for they are in fact Royal degrees granted by the Sovereign, and thus take precedence over all other degrees. The Archbishop merely issues an instrument nominating a certain person to a certain degree, but the final clause makes it null and void of effect unless it receives the Sovereign's Royal Letters Patent in confirmation thereof. The Letters Patent repeat this fact and confirm the degree, which is then registered in the House of Lords. The degree is actually *per litteris regis*.—I am, etc.,

Lincoln, Oct. 5th. Charles A. H. Franklyn.

INTERNATIONAL CONGRESS OF MEDICAL HISTORY AT MADRID

The tenth of the international congresses of the History of Medicine, which are held every second year in various capitals of Europe, met at Madrid from September 22nd to 29th, under the presidency of Dr. Gregorio Marañón, who is well known both as a medical historian and as a Spanish physician. The British Government was represented by Sir Humphry Rolleston and Dr. John D. Comrie of Edinburgh. Other British members included Professor J. A. Nixon and Dr. J. D. Rolleston.

The formal proceedings opened with a reception of the delegates and members of the congress in the palace of the Senate on the evening of September 22nd; this was attended by about 400 persons, who came from many countries, in some cases from as far distant as the Philippine Islands and Peru. On September 23rd members were conveyed by motor car to Toledo, where they were received by the civil, military, and ecclesiastical authorities of the city. The Archbishop of Toledo presided at the inaugural session, which was held in the old hospital of Santa Cruz founded by Cardinal Mendoza and Queen Isabella at the beginning of the sixteenth century. This magnificent building with richly ornamented roof contains four large wards arranged in the form of a cross, and was used in the sixteenth century for the treatment of cases of contagious disease. The remainder of the day was spent in visiting the historic buildings, Moorish and Renaissance, in which Toledo is so rich; in the evening guests were entertained at the country house of Dr. Marañón. Throughout the week the congress continued its morning meetings in the Senate House at Madrid, while the afternoons were devoted to various excursions to museums and places of historic interest in the neighbourhood.

Among the many subjects discussed was that of Arab medicine in Spain, with various communications upon Arab medicine in general and medicine among oriental peoples. This was followed by a discussion and papers upon medicine in America during the discovery and colonization of the New World and in the colonial territories of Spain. Later in the week the medical folklore of Belgium, Morocco, Argentina, Peru, Poland, the Canary Islands, Armenia, Scotland, etc., was discussed. On the last day of the congress various papers on independent subjects were read. Some of the most interesting of these dealt with: Arnold of Villanova (Professor Diepgen, Berlin); the first hospital for workmen's accidents, founded at the Escorial of Philip II (Dr. Decref, Madrid); the history of the mineral waters of the Pyrenees (Dr. Guitard, Paris); surgery of the sixteenth century in Spain (Dr. Escribano, Granada); history of Spanish psychiatry (Dr. Riera, Saragossa); history of the psychology of India (Dr. Ibanez, Barcelona); evolution of neuropsychiatry in Rumania (Dr. Paulian, Bucarest); the temples of Greek medicine (Dr. Rosello, Montevideo); history of the plague in Turkey (Dr. Suheyl, Istanbul); and the necessity of making obligatory the study of medical history in the universities (Dr. Szumowski, Cracow).

On Saturday, September 28th, an excursion was made to the Palace of the Escorial, where the old manuscripts of the library and artistic treasures were displayed. On the following day, after the closing of the congress, there was an interesting ceremony at the old University of Alcalá de Henares, when some eight official representatives of the various nations attending the congress received the honorary membership of the College of Physicians of Madrid. This ancient university, which once numbered some 10,000 students, has now been absorbed by the University of Madrid, and only its buildings remain. The town is also celebrated as the birthplace of various distinguished men, including Cervantes, the author of *Don Quixote*. The ceremony was carried out with old-time observances of mace-bearers, robes, and procession, and the honorary degrees were conferred with the accolade of a sword presented by the president. As a representative of England Sir Humphry Rolleston received this honour. In contrast to this ancient ceremony the congress had, earlier in the week, visited the new university on the outskirts of Madrid, which is at present under construction and of which part is expected to be ready for occupation this autumn. The buildings extend over about a square mile of ground to the north of the city, and were begun in 1930. They include large modern laboratories, and the clinical department will comprise a new hospital with between 1,500 and 2,000 beds. A party of the congress also visited Dr. Marañón's clinic in the Madrid General Hospital. This section of the hospital, built and equipped by Dr. Marañón some years ago in modern style, with biochemical laboratory, *x*-ray plant, etc., is devoted largely to the study of endocrine disorders, which appear to be of frequent incidence in Spain, and in the study of which Dr. Marañón is a recognized authority. Members were shown many cases of pituitary and thyroid dysfunction, Addison's disease, etc. An admirable display of Arabic and other old Spanish medical books, and of several dioramas illustrative of historic scenes in Spanish medicine, had been arranged by the Wellcome Historical Research Museum, London, and was on view at the congress. This museum had also issued, prior to the congress, a small commemorative book dealing with Spanish influence on the progress of medical science.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Raymond Horton-Smith prize for the academic year 1934–5 has been awarded to Arthur Carleton Crooke, M.A., M.D., Queen's College, the subject of whose M.D. thesis is, "The Changes in the Basophil Cells of the Pituitary Gland in Human Disease"; and James Montague Wallace, M.A., M.R.C.S., Downing College, subject, "The Red Cell Adhesion Test and Other Serological Reactions in Trypanosomiasis," who are adjudged equal.

UNIVERSITY OF LONDON

The following appointments are announced: Honorary Research Assistant in the Department of Anatomy and Embryology: Dr. E. E. Evans Pritchard. Honorary Research Assistant in the History of Medicine: Mr. R. Somerville. Demonstrators in Anatomy: Mr. M. C. Lendon and Mr. M. T. Greig.

Birkbeck College

At a meeting held at 29, Portman Square, W., on October 2nd, Lord Luke announced that the Duke of York had accepted the invitation to become president of Birkbeck College, of which the King and Queen are patrons. It was also reported that the Court of London University had allotted a position to the College on the Bloomsbury site, where it will become an integral part of the new University buildings. From its foundation in 1823 to 1866 the college was known as the Birkbeck Literary and Scientific Institution, and the first president was Dr. George Birkbeck, a general practitioner, who held the office until his death in 1841. The name of the institution was changed to Birkbeck College in 1907, and in 1921 the college was admitted as a school of the University of London for evening students. A further meeting in connexion with the plans for rebuilding the college will be held at the Mansion House on November 7th.

London Hospital Medical College

The second open scholarship of the value of £160 for the session 1935–6 has been awarded to A. P. Dick.

London School of Hygiene and Tropical Medicine

The following candidates have been approved at the examination indicated:

Academic Post-Graduate Diploma in Public Health.—W. Ainslie, F. H. Morrell, R. M. M. C. Orpwood, Sheilah R. Ross.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examination indicated:

Diploma in Public Health.—(*Part II*): J. B. Mackie, H. E. C. Sutton, Patricia I. Unsworth.

Obituary

E. MUIRHEAD LITTLE, F.R.C.S.

Consulting Surgeon, Royal National Orthopaedic Hospital

The death of Mr. Muirhead Little on October 2nd at his home in Westminster removes one who did great work for orthopaedic surgery, and a large-hearted scholarly man to whom the British Medical Association and its *Journal* owe a lasting debt of gratitude. For some time past he had felt the burden of advancing years, and his health and strength declined so much that at the age of 80 he asked to be excused from further literary tasks.

Ernest Muirhead Little, youngest son of William John Little, M.D., F.R.C.P., of Park Street, London, and Eliza, daughter of Thomas Roff Tamplin of Lewes, was born at his father's country house at Ealing on July 26th, 1854. It was largely through W. J. Little (1810–94) that the methods of Stromeyer of Hanover in the treatment of deformities became known to the world about 1839. His son Ernest, after leaving Westminster School at the age of 16, worked for a time, though reluctantly, in an insurance office and afterwards with a tea importer; he then entered St. George's Hospital. During his student days he served with the National Aid Society's ambulance in the Turco-Serbian War of 1876, receiving the Takova gold cross. He became M.R.C.S. in 1880, L.R.C.P. in 1881, and F.R.C.S. in 1886. After a short period on the surgical staff of the Seamen's Hospital dispensary he was appointed surgical registrar to the National Orthopaedic Hospital; thenceforward his professional career was largely linked with that institution as surgeon and consulting surgeon; he retired from the active staff in 1919. He was also for nearly forty years surgeon to the Surgical Aid Society. As a young man newly qualified he undertook the duties of junior secretary to the International Medical Congress in London in 1881, and when the congress met here again in 1913 he held office as vice-president of the Section of Orthopaedics.

Muirhead Little was one of the founders and first president of the British Orthopaedic Association, and in 1894 he was elected a corresponding member of the American Orthopaedic Association. At the foundation, during the great war, of Queen Mary's Hospital at Roehampton for limb-fitting for disabled soldiers, he became surgeon-in-charge, and remained in that post until after the armistice. On his resignation from the staff of Queen Mary's Hospital he became a member of the Advisory Council of the Ministry of Pensions and one of the Minister's advisers on artificial limbs. It is probable that Muirhead Little had a greater opportunity of gaining experience in the fitting of limbs than any other surgeon in this or any other country. The fruits of his experience in this branch of surgery were set forth in the book *Artificial Limbs and Amputation Stumps*, which he published in 1922.

For many years Muirhead Little was a frequent and much-valued contributor to the *British Medical Journal*, writing mainly on orthopaedics and general surgery, and on subjects related to the history of medicine and medical biography. With the late C. Louis Taylor he collaborated often in the earlier papers which established "Nova et Vetera" as a feature of the *Journal*. Many articles and notes from his pen appeared in that section, some over his name or initials, but most of them unsigned. He and Sir Dawson Williams were old friends with a deep regard and affection for each other. The help he had given under Dawson Williams's editorship was continued with self-effacing loyalty after the latter's death, during a difficult period when the small indoor editorial staff was undergoing frequent changes. His last important work for the *Journal* was the series of articles "The First 100 Years" which formed the basis of the Centenary History of the British Medical Association. He had joined the Association in 1892, but took no part in its medico-political work. At the Annual Meeting at Aberdeen in 1914 he was vice-president of the Section of Diseases of Children, and at the Bath meeting in 1925 he was vice-president of the Section of Orthopaedics, becoming President of the same Section a year later at Nottingham. The task of preparing the History of the Association required laborious study of documents, books, and files, which taxed his energy for many months before the volume appeared in July, 1932. Much of the personal material could have been expanded had he given rein to his knowledge of the leading medical figures in the Victorian era.

Muirhead Little's earliest publication was a small book *On In-Knee Deviation*, written jointly with his father in 1882. His standard book on *Artificial Limbs and Amputation Stumps* has already been mentioned. Among papers read to various Sections of the Royal Society of Medicine was "Glisson as an Orthopaedic Surgeon" in 1926. He contributed also an interesting paper on "Orthopaedics before Stromeyer" to the *Robert Jones Birthday Volume* in 1928. At the time of his death he was the oldest member of the Casual Club, a mixed body including representatives of many professions who meet during the winter to read papers and discuss them. In the autumn of 1929 he read before the Osler Club a paper entitled "Ernest Hart—a Study of Character," giving therein a candid view of the remarkable man who was Editor of the *British Medical Journal* for thirty years. Eighteen months earlier he had collaborated anonymously in the memoir of Hart's successor, Dawson Williams, which appeared in these columns.

It was characteristic of the man that during the war he gave to merchant seamen's charities all the profit derived from improvement in some shipping shares held

by him, for he declined to make money out of the dangers seamen were enduring. The genuine modesty of his nature was shown by his refusal in after years to allow any mention to be made of the following incident: In 1898 he knowingly contracted diphtheria from a child patient in hospital, whose life he tried to save by removal of the diphtheritic membrane. On his recovery a presentation was made to him by the then Duke of Marlborough as chairman of the committee of the hospital.

He married in 1890 Mary, only daughter of John Burgess Knight of Holland Park, London, who survives him with three sons and one daughter. His nephew, Vice-Admiral Sir Charles Little, K.C.B., has recently been appointed to the command of the China Station.

A memorial service was held at the Church of the Annunciation, Bryanston Street, W., on October 7th, when the congregation included Dr. C. O. Hawthorne and Dr. Alfred Cox, vice-presidents of the British Medical Association, and the Editor of the *Journal*.

Mr. E. Laming Evans writes:

Ernest Muirhead Little was the fourth son of William John Little, physician to the London Hospital, whose work on spastic paraplegia is known the world over, under the synonym of Little's disease. He was educated at Westminster School, and retained his affection for his old school all his life by attending the Latin Play each year, and proved his loyalty and appreciation by sending his sons there in due course. His father had suffered from some shortening of the tendo Achillis, for which he was treated by division of the tendon by Stromeyer. It is not unnatural, therefore, that Ernest, finding a business career uncongenial, should escape to St. George's Hospital, intent upon acquiring a knowledge of orthopaedic surgery, about which he had heard so much from his father at home and from Stromeyer himself when staying in Park Street, Grosvenor Square. He was elected surgical registrar to the National Orthopaedic Hospital in 1888, and in due course honorary surgeon.

Orthopaedic surgery was a very minor specialty in those days; much treatment was instrumental and most operations were subcutaneous sections. At that time operations at the hospital were performed by the whole staff on one morning in the week, and the out-patient waiting hall was temporarily converted into an operating theatre. Conditions at the Royal Orthopaedic Hospital were very similar, except that the house-surgeon's sitting room was converted each Monday afternoon into a theatre, the entry of the massive wooden operating table temporarily terminating his tenancy. No wonder that the King's Fund stepped in and forced an amalgamation of the Royal and National Orthopaedic Hospitals in 1905 (the City joined later). Little strenuously opposed the amalgamation, which was later to afford him the opportunity of practising modern surgery in a hospital of 446 beds, compared with the fifty that were then at his disposal. It was not until 1905, after the Charter of Amalgamation of the Royal and National had been granted by King Edward, that a small room on the ground floor, facing Bolsover Street, was converted into a permanent operating theatre, and that Little had the advantage of operating with comparative safety. He was then over 50 years of age, and his late opportunity undoubtedly handicapped him in acquiring an operative technique which progress in surgery demanded. In 1909, when the present hospital in Great Portland Street was opened by King Edward and Queen Alexandra, Little, as senior surgeon, showed King Edward round the wards.

In 1913 he was vice-president of the Orthopaedic Section at the International Congress of Medicine in London. Contending interests were rendering the committee's task of selecting an opener for the first discussion difficult. The mere suggestion that Little should open on Little's disease settled at once both opener and subject. Little had no enemies, and excited no professional jealousy. His judgement was generally sound, his knowledge of the literature of orthopaedic surgery was encyclopaedic, and his writings a mixture of erudition and scholarship. In 1913 he was elected first president of the Subsection of Orthopaedic Surgery (as it then was) of the Royal Society of Medicine, and remained in that office until 1919. He was likewise first president of the British Orthopaedic Association. In 1895 he was appointed surgeon to the Royal Surgical Aid Society in succession to Mr. Herbert Allingham, who was the son of that society's original surgeon, Mr. William Allingham. He held that office for thirty-nine years, and only resigned, when 80, owing to the increasing dangers of London traffic. On one occasion he saw no fewer than one hundred patients on one day, and was very proud of it. As senior surgeon for twenty-four years, he responded yearly to succeeding Lord Mayors at the annual general meeting at the Mansion House. During the war he was surgeon-in-charge to Queen Mary's Auxiliary Hospital at Roehampton, where disabled officers and men were fitted with artificial limbs. Many stumps were unsuitable for fitting and required re-amputation, and he brought an immense experience to aid these difficult cases. As a result of this experience he published a book on artificial limbs and amputation stumps, which is the standard book of reference on the subject.

He was of singularly striking appearance, and his good looks remained with him throughout his old age. He might easily have been mistaken for a bishop or a judge. He was of abstemious habits, eating sparingly and drinking in moderation. He could enjoy a good dinner, and it is less than two years ago since he dined with his colleagues of the Royal National Orthopaedic Hospital at their annual staff dinner. He went out to dine for the sake of congenial companionship rather than for the fare that was placed before him. His entertainments in Seymour Street were simple, kindly, and much enjoyed by those who had the privilege of being his guests. There also it was the brilliance of his conversation that was the mainstay of the evening. He was not keen on games, but enjoyed a country walk among the charms of nature. He endeared himself to all with whom he came in contact: house-surgeons respected him, nurses obeyed him with alacrity, and he was adored by his patients, being tolerant of their case histories almost to indulgence. His religious views were broad-minded and sincere, and he carried out these principles in daily life.

Mr. Arthur Rocyn Jones writes:

Orthopaedic surgeons all over the world will read with regret of the death of Muirhead Little. He started his career at a time when subcutaneous surgery and manipulation held the field in the treatment of deformities, and he was therefore about the last link with the tenotomy period in the development of orthopaedic surgery. It may be said that from infancy Little had been brought up to orthopaedics, for his father, W. J. Little, was the founder of orthopaedic surgery in England, having performed the first tenotomy in London in 1837. And two years later, when he was assistant physician to the London Hospital, he wrote the first English book on an orthopaedic subject, *A Treatise on Club Foot and Analogous Distortions including their Treatment*. Again, on October 2nd, 1861, the elder Little read his classical paper on infantile spastic paraplegia before the Orthopaedic Society of London—a malady since known as Little's disease. At St. George's Hospital the son came under the influence of

Timothy Holmes, who seems to have taken a special interest in shaping Little's surgical career.

At the beginning of his career Muirhead Little suffered somewhat from the shadow of his distinguished father, but as he developed he began to take a place of his own in the estimation of his contemporaries, for, in contrast to his father, he had had a purely surgical training. W. J. Little was a physician who, through the accident of a personal affliction, was led to pioneer the orthopaedic movement in England ; but he remained a physician all his life, and such operating as he permitted himself to perform was restricted within the narrow limits of subcutaneous surgery. Muirhead Little, however, was one of the first orthopaedic surgeons in England to attempt the correction of deformities by open operation. And it was amusing to hear him describe how in the early 'nineties he was subjected to violent criticism by senior colleagues for having dared to perform a tarsectomy in a case of intractable talipes varus. Through his writings he gradually became known internationally, and he wrote steadily throughout his career, mainly upon congenital and paralytic deformities. As an operator Muirhead Little was careful and conscientious, but operating skill was not a strong feature of his ; this may have been due to his weak eyesight. In what may be called clinical orthopaedics and the knowledge of its literature he was in his day almost unrivalled. Those who were wise and humble enough to seek his opinion had cause to be thankful. His judgement as to the ultimate issue of any procedure proposed was unfailing, and he was very fertile of suggestions in the difficult case. He had a tenacious memory, and could give references with amazing accuracy for particular papers in the literature ; and in this respect Little was very approachable, and would take no end of trouble to satisfy the quest of those who appealed to him.

After the war, in association with Sir Robert Jones and others, Little helped to found the British Orthopaedic Association ; and Sir Robert, who might quite reasonably have expected to be the first president, insisted on Muirhead Little for the chair. The original members will recall Little's kindly hospitality to the then small association at his country house. He took great interest in the history of medicine, and those who have read his "Glisson," "Byron's Malady," and "Boots and Shoes" will detect his literary gifts. His editing of the *History of the British Medical Association* for the Centenary Meeting of 1932 was widely commended. He was a careful writer of smooth English, and never wrote anything in slipshod style. For many years he took a leading part in the Casual Club, and contributed studies on Peacock and other lesser-known English writers. No surgeon ever gave greater consideration to his hospital patients, and he was beloved by them in return. He was punctilious in his hospital duties, a quality that often pressed hard on his less virtuous subordinates. In Muirhead Little the profession has lost one of the most honest and sincere of men, and orthopaedic surgery a pioneer beloved of everyone who came in contact with him.

Dr. Alfred Cox writes:

The British Medical Association owes a tribute to the man as well as to the eminent orthopaedic surgeon, for he was indeed a good friend of ours. I saw a great deal of him when we were preparing the Centenary History of the Association, and to see much of him was to develop a real affection for him. I note in the excellent obituary notice in the *Times* that much stress is laid on the essential modesty of the man, and this could not fail to strike anyone who came much in contact with him. It was with considerable difficulty that we induced him to allow his name to be put on the title-page of the *History*, and he would only consent to do so on condition that we said it was "compiled" by him and not "edited." He would not have it that his work deserved the more ambitious title. But I know perhaps better than anyone the patient and long-continued work which the production of the volume entailed on him. A great deal of research into old numbers of the *Journal* and the archives of the office was involved, and many interviews with various people. Such a task meant a great deal to a man who was no longer young and was obviously tired. I do not think he would have been willing to undertake such a big task for any other cause, but he was deeply attached to the Association, and regarded the publication of its history as a great event, in which he was proud to take an active and useful part. I am glad to think that the memory of such a devoted friend of the Association and a most lovable personality is perpetuated on the title-page as well as in the contents of its Centenary History.

H. W. DUDLEY, Ph.D., F.R.S.

With the death of Dr. Harold Ward Dudley in a London nursing home after a short illness, at the age of 48, there ends a life of unselfish service to biochemistry and the chemical aspect of modern therapeutics. Dudley was born at Derby on October 30th, 1887, the eldest son of Florence and the late Rev. Joshua Dudley. After an early education at Truro and Morpeth, he entered Leeds University, where he came under the guiding influence of the late Professor J. B. Cohen, F.R.S. He took the degree of M.Sc. in chemistry in 1910, and in the same year was awarded an 1851 Science Research Scholarship. On Cohen's advice he proceeded to Berlin to Emil Fischer's laboratory, and worked with Professor Wilhelm Traube on purines ; he was awarded his Ph.D. (Berlin) in 1912. Dudley now had the greatest good fortune in an appointment as assistant in the Herter Laboratory, New York, where he came under the influence of another brilliant Leeds student, H. D. Dakin, F.R.S. The collaboration of Dakin and Dudley was a most fruitful one. A comprehensive study of the intermediary metabolism of carbohydrates, proteins, and amino-acids led to the discovery of the important enzyme glyoxalase. This was followed by a novel attack on protein structure by an investigation of the racemization of proteins and of the influence of enzymes on the products obtained. This field received further attention in collaboration with Dr. H. E. Woodman at Leeds, where Dudley was lecturer in biochemistry from 1914 to 1915. On the outbreak of war he was attached to the R.A.M. College, London, for special chemical investigation, and in 1918, as major in the Royal Engineers, was in charge of the anti-gas mission to the U.S.A.

At the conclusion of hostilities he joined the staff of the Medical Research Committee (later Council) as chief biochemist. His wide experience and training now received full scope in attacks on numerous urgent and difficult problems with important bearings on medicine. One of the most formidable problems was that of the chemical nature of those constituents of the posterior lobe of the pituitary body which have such intense physiological activity and are of such great therapeutic importance. Dudley showed that the pressor constituent and the constituent responsible for causing contraction of uterine muscle were separable by chemical means. After a visit to Toronto to gain first-hand information about the discovery of insulin by Banting and Best, Dudley, on his return to this country, soon improved the small-scale manufacture of insulin ; this resulted in an increased yield and in a product of greater purity. The findings were immediately made available to hospital

workers and manufacturers, with the result that insulin of high quality was early available in this country. Dudley's method of obtaining insulin in a dry, stable form, involving its preliminary precipitation as a picrate, enabled him to take charge of the final preparation of the first international standard of insulin.

In collaboration with Dr. O. Rosenheim and Mr. W. W. Starling the constitution of spermine, a strong aliphatic base found in all the cellular tissues of the body, was solved, the base being finally prepared by synthesis. Accompanying spermine in the body, a new related base, spermidine, was also discovered and later synthesized, but the significance of these bases in vital chemistry is still not known. The importance of certain vaso-dilator constituents of the animal body with a histamine-like action for the normal functioning of the capillaries had long been emphasized by Sir Henry Dale. Dudley, with W. V. Thorpe, was able to identify the substance having this action as histamine itself, by isolation of that substance from lung, liver, muscle, and spleen under conditions which precluded putrefactive changes and avoided drastic chemical action. This was a notable achievement, but it was surpassed shortly afterwards by his isolation of that extraordinarily labile substance, acetylcholine, from spleen. This proof of the occurrence of acetylcholine in the animal body has led to, and is still leading to, important developments in the physiology of the nervous system and its chemical control.

During the last few years Dudley devoted his attention to the chemistry of ergot. Until 1932 the nature of the active principles of ergot was regarded as a closed chapter, but the clinical observations of Dr. J. Chassar Moir proved the existence of a principle which acted promptly on uterine muscle when taken orally. The collaboration of Dudley and Moir led to the isolation and characterization of a new simple water-soluble alkaloid, ergometrine, from ergot, which in minute doses had the characteristic activity of ergot. This discovery of ergometrine, made only a few months before Dudley's fatal illness, solves a long-outstanding problem of the pharmacology of ergot and its use in therapeutics. It has aroused wide interest, as is evidenced by the fact that it has already been confirmed, in effect, in three other laboratories where research was independently in progress. Dudley's services to biochemistry did not end with his laboratory activities. He was secretary of the Biochemical Society from 1922 to 1924, joint editor with Professor A. Harden of the *Biochemical Journal* from 1924 to 1930, and was for many years responsible as an assistant editor of *British Chemical Abstracts* for the high accuracy of the section of abstracts on biochemistry. He was elected F.R.S. in 1930.

Dudley leaves to his colleagues at the National Institute and to biochemists in many laboratories of many countries the memory of a devoted servant of science, working steadily, with unfailing patience and precision, and caring only for truth. The charm of his quiet, modest personality enriched with a sly humour and warmed by steadfast affection, brought him many devoted friends; and many who came less close to him will remember his unselfish readiness of aid to all who shared his interests.

The death took place, after an operation, at the Perth Royal Infirmary on October 2nd, of Dr. JOHN HUME, a well-known practitioner of Perth. Dr. Hume studied medicine at Edinburgh University, where he graduated M.B., Ch.B. in 1893, proceeding subsequently to the M.D. in 1914. He also took the D.P.H. of St. Andrews in 1913. At the time of his death he had been in practice in his native city of Perth for over thirty years, and he took a keen interest in the progress of charitable and philanthropic institutions for the benefit of the community. He was physician to the Royal Infirmary of Perth and medical officer of health for Abernethy and Coupar Angus. He was an active member of the British Medical Association, and had acted for many years as secretary of the Perth Branch of the Association, being at the time of his death also a member of the Scottish Committee and of the Insurance Acts Subcommittee. The funeral took place at Wellshill Cemetery, Perth, on October 5th.

Dr. HUGH WALKER, who died in Glasgow in his seventieth year, had specialized in ophthalmic surgery during nearly all his professional life, and was well known and highly esteemed in Western Scotland. He was the eldest son of the late Dr. Walker of Pollokshaws, and his younger brother is still in practice there. After graduating M.A. in the University of Glasgow in 1887, he went to Edinburgh and graduated M.B., C.M. in that university in 1893, with first-class honours; he also won the Beaney prize in anatomy and surgery. He was elected a Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow in 1919. After a short period of private practice, he concentrated his attention on ophthalmology, and studied in Berlin and London. He was responsible for the translation into English of Professor C. R. Greeff's *Guide to the Microscopical Examination of the Eye*. He was for some time pathologist to the Glasgow Ophthalmic Institute, and in 1903 began his long connexion with the Glasgow Victoria Infirmary as ophthalmic surgeon; when he reached the age limit, four years ago, he was retained in a consulting capacity. During the war he held a commission in the R.A.M.C.(T.), with the rank of major, and joined the Serbian Army as a specialist in eye injuries and diseases. His good knowledge of German enabled him also to be very useful as an interpreter, and he was ultimately the recipient of the Order of St. Sava. On returning to Glasgow, he resumed private practice, and was ophthalmic surgeon to the Glasgow School Board. He was elected a member of the British Medical Association in 1921.

Dr. DAVID PHILLIPS, who died at his home, Green Court, Llandilo, Carmarthenshire, on September 21st at the age of 72, received his medical education at the Middlesex Hospital, and qualified M.R.C.S., L.R.C.P. in 1895. He was the medical officer of health for Llandilo, medical officer to the Children's Welfare Clinic, and public vaccinator. He joined the British Medical Association in 1902, and held office as president of the South Wales and Monmouthshire Branch in 1929-30. Dr. Phillips was one of the senior medical practitioners in Carmarthenshire, having been in practice at Llandilo for about forty years.

We regret to record the death on September 28th of Dr. CHARLES EDWARD SHELLY at Hadleigh, Suffolk, at the age of 81. He was born at Nuneaton in 1854, and received his education at the Wick, Brighton, and Sidney Sussex College, Cambridge. After obtaining a first class in the Natural Sciences Tripos he was appointed lecturer in chemistry in the University of Cape of Good Hope. He returned to England in 1878, and continued studying for the medical profession at St. Bartholomew's Hospital. He qualified M.R.C.S. in 1879, and in the same year graduated M.B.Cantab., with a first class in medicine and surgery, proceeding M.D. in 1890, and obtaining the M.R.C.P. four years later. He then began practice at Hertford, and was appointed medical officer to Haileybury College in 1880 and medical officer to Hertford County Hospital in 1884, becoming consulting physician to that institution in 1917, and later to the Hertford and Ware Joint Isolation Hospital and to Haileybury College. Dr. Shelly was a man of wide interests. He was a member of the council and past president of the Association of School Medical Officers, and published an article on epidemics in schools. He contributed articles on health readers, arts, and exercise to *Quain's Dictionary of*

Medicine, and on constipation to *Fowler's Dictionary of Practical Medicine*; and was also a medical referee for the Royal National Hospital for Consumption and the British Home for Incurables and an honorary life member and examiner to St. John Ambulance Association. Dr. Shelly took particular interest in radiological research and in ophthalmology. He had been a member of the British Medical Association for forty-eight years, and was vice-president of the Metropolitan Counties Branch in 1920, and a member of the Medical Officers of Schools Sub-committee from 1925 to 1929.

We regret to record the death on September 12th of Dr. Edwin Evanson Jones of Openshaw, Manchester. Dr. Jones, who was the son of the late Dr. Edwin Jones of Rhyl, took the Scottish triple qualification in 1887. After holding posts at the Chorlton Union Hospitals and the Chorlton-upon-Medlock Dispensary, he was appointed medical officer to the Openshaw District, Manchester Area. Dr. Jones had been in continuous membership of the British Medical Association since 1888.

Medical News

The St. Bartholomew's old students' dinner will be held for the first time in the College Hall, Charterhouse Square, on Tuesday, November 5th, at 7.30 for 8 p.m., with Mr. W. Girling Ball in the chair. H.R.H. the Prince of Wales (a Perpetual Student of the college) has signified his intention to be present. The occasion will be regarded as the official opening of the new college.

Professor William Bulloch, F.R.S., will deliver the Schorstein Memorial Lecture on "Medical Periodical Literature" in the anatomical theatre at the London Hospital on Thursday, October 17th, at 4.15 p.m. Members of the medical profession are invited to attend.

Professor R. A. Fisher, F.R.S., will deliver two lectures on "Eugenics and National Health" at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C., on Wednesdays, October 16th and 23rd, at 4.30 p.m. Professor Major Greenwood, F.R.S., will take the chair at the first lecture.

Dr. S. W. Fisher of the Mines Department will address the Advisory Medical Committee of the Industrial Welfare Society on "Medical Aspects of a Miner's Life," at 14, Hobart Place, S.W., on Tuesday, October 15th, at 5.30 p.m.; at 7.45 p.m. Dr. D. A. Coles, who is retiring from the chairmanship of the committee, will be entertained to dinner at the Goring Hotel, Ebury Street, S.W.

Dr. L. A. Rowden will deliver his presidential address on "Looking Backward and Looking Forward" before the British Institute of Radiology, at 32, Welbeck Street, W., on Thursday, October 17th, at 8 p.m. On Friday, October 18th, meetings will be held—at 3.30 p.m. by the medical committee, and at 5 p.m. by the medical members.

A series of lectures on "The Hygiene of Youth" will be delivered under the joint auspices of the Royal Institute of Public Health and the Institute of Hygiene at 28, Portland Place, W., on Wednesdays, at 3.30 p.m., from October 23rd to November 27th, both dates inclusive.

A drawing-room meeting in support of the Society for the Visitation of the Sick in Hospitals will be held at 133, Harley Street on Wednesday, October 16th, at 4 p.m. The speakers include Professor D. M. Blair, dean of the medical faculty, King's College, London.

A meeting of the Medico-Legal Society will be held at 26, Portland Place, W., on Thursday, October 24th, at 8.30 p.m., when Dr. C. A. Mitchell will deliver his presidential address on "Forensic Chemistry in Relation to Medicine." Readers are asked to note the new meeting-place of the society.

A sessional meeting of the Royal Sanitary Institute will be held at Bangor Town Hall on Friday, October 18th, at 3 p.m., in conjunction with the Welsh Branch of the Society of Medical Officers of Health. Papers will be read on "Control of Infectious Diseases in Rural Areas," by Dr. D. E. Parry Pritchard, and on "Housing and Town Planning," by Mr. B. Price Davies.

The programme for 1935–6 of the West Kent Medico-Chirurgical Society opens to-day (Friday, October 11th) with the annual general meeting. Addresses will be given on November 8th, by Dr. Charles Beney, on "The Chronic Discharging Ear"; on December 13th, by Mr. W. Sampson Handley, on "Gastric Derelicts"; on February 14th, by Dr. Geoffrey Bamber, on "The Treatment of Some Common Affections of the Skin"; and on March 13th, by Dr. Harold Crampton, on "The Unexpected in Anaesthesia." A clinical evening will be held on January 10th. On April 3rd there will be a debate on the motion "That the Neurotic Patient should be Treated by his own Family Doctor." On May 6th the president will deliver his address, and the annual dinner and dance will be held at Chiesman's Restaurant, Lewisham, S.E., on May 16th. All other meetings will be held at the Miller General Hospital, Greenwich, S.E., at 8.45 p.m.

A meeting of the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, W.C., on Wednesday, October 16th, at 5.30 p.m., when Mr. M. Wiedling will exhibit and describe some new types of Leitz microscopical equipment.

The annual meeting of the British Orthopaedic Association will be held in Manchester on Friday and Saturday, October 25th and 26th. The discussion on the first day, on fractures of the os calcis, will be in three parts: (1) "The Economic Results in Os Calcis Fractures," openers are Mr. B. L. McFarland and Mr. W. J. Eastwood, followed by Mr. J. P. Hosford, Mr. R. J. Furlong, and Mr. T. T. Stamm; (2) "Results of Attempted Reduction in a Series of Recent Fractures," to be opened by Dr. E. E. Myers of Boston, U.S.A.; and (3) "The Treatment of Old Fractures," to be opened by Mr. R. Ollerenshaw and Mr. A. H. Todd. On the second day short papers will be read as follows: "The Use of Substandard Cinematograph Films in Case-recording" (Mr. Ollerenshaw); "The Mechanism of Bone Absorption" (Professor S. L. Baker and Dr. E. W. Twining); "Congenital Torticollis" (Mr. C. H. Gray); "Osteochondritis in Cases of Congenital Dislocation of the Hip" (Dr. M. F. Johnstone); and "Fractures of the Internal Epicondyle of the Humerus" (Mr. H. O. Clarke).

The Joint Tuberculosis Council has arranged a post-graduate course to be given by the medical and surgical staff of Brompton Hospital from Monday, November 4th, to Saturday, November 9th, at 10 a.m. daily. All inquiries should be addressed to Dr. William Brand, honorary secretary for post-graduate courses, Joint Tuberculosis Council, 8, Christchurch Place, Epsom, Surrey.

A post-graduate course in urology will be held at St. Paul's Hospital, Endell Street, W.C., on Wednesdays, at 4.30 p.m., from October 16th to November 27th (both dates inclusive). The course is free to registered medical practitioners and students.

The Fellowship of Medicine (1, Wimpole Street, W.) announces the following courses: gynaecology, at Chelsea Hospital for Women, October 21st to November 2nd; neurology, at West End Hospital for Nervous Diseases, October 21st to 26th; chest diseases, at City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E., October 28th to November 2nd; anatomy and physiology, at Infants Hospital, Vincent Square, S.W., on Mondays, Wednesdays, and Fridays, at 8 p.m. (in preparation for the primary F.R.C.S.); obstetrics, at City of London Maternity Hospital, October 19th and 20th; physical medicine, at St. John Clinic, October 26th and 27th. Lectures will be given on endocrinology on October 15th and 17th, at 8.30 p.m., at National Temperance Hospital; on radium in gynaecology, by Dr. Malcolm Donaldson, October 16th, at 4 p.m., at Medical Society of London, 11, Chandos Street, W. On October 15th and 16th, at 5 p.m., Mr. C. L. Gimblett and Mr. G. G. Penman will give demonstrations of medical ophthalmology for M.R.C.P. candidates at Royal Westminster Ophthalmic Hospital. Courses and demonstrations arranged by the Fellowship are open only to members.

A series of post-graduate lectures will be given at Ancoats Hospital, Manchester, on Thursdays, at 4.15 p.m., from October 17th to November 28th, both dates inclusive. On December 5th, at 4.15 p.m., medical and surgical cases will be discussed at a clinical meeting.

We are asked to announce that the weekly lecture and demonstration at the Hospital for Sick Children, Great Ormond Street, W.C., details of which are given in the diary column of the *Supplement*, form part of a series. Full particulars may be obtained from the dean.

On October 7th the new Vice-Chancellor of Manchester University (Professor J. S. B. Stopford) and Mrs. Stopford were entertained to dinner in the Whitworth Hall of the University by members of the Court, Council, Senate, and teaching staff. The large company included the Chancellor (Lord Crawford and Balcarres), the chairman of council (Sir Christopher Needham), the treasurer (Sir Ernest D. Simon), the Pro-Vice-Chancellors (Professors Gibson and Stocks), the chairman of Convocation (Dr. T. A. Goodfellow), the Lord Mayor of Manchester, and the Mayors of Salford, Blackburn, Bolton, and Wigan, the president of the Manchester Chamber of Commerce, the chairman of the Manchester Royal Infirmary, and the presidents of the Manchester Medical Society and Manchester Law Society.

The issue of *Paris Médical* for September 21st and of the *Deutsche medizinische Wochenschrift* for September 27th are devoted to blood diseases.

The Academy of Sciences of Rome announces that a Bocconia prize of 150,000 lire will be awarded for the best work on the aetiology and treatment of malignant growths.

Professor Roussy, dean of the Paris faculty of medicine, has been nominated an officer of the Legion of Honour.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, five lines).

The **TELEGRAPHIC ADDRESSES** are

EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

MEDICAL SECRETARY, *Medisecra Westcent, London.*

The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Chronic Arthritis

"J. H." (Renfrewshire) writes: I shall be grateful for any suggestions as to treatment in the following case. Lady, later middle age, has suffered for one and a half years from arthritis. The finger and thumb joints are the ones giving most trouble now. She has had all kinds of internal treatment, spa treatment, and ultra-violet rays. Any local form of treatment makes the joints worse; in fact, cold water gives most relief for the time being.

Blepharitis

Mr. Sydney Tibbles writes, in answer to "M.B., Ch.B." (October 5th, p. 650): If he first soaks the scales between the roots of the lashes in a tepid solution of 1 per cent. sodium bicarbonate they will become loosened or dissolved, and any debris can be removed with a blunt-pointed instrument; should any raw surface be found below the crusts apply 1 per cent. silver nitrate in solution on a fine brush; then, and not till all traces of the crusts have been removed, apply ung. hyd. ox. flav. to the edge of the lids. Build up the patient's health, and be certain that any glasses she is wearing are absolutely correct; if they are not, they may merely produce another error in place of the one she originally had. It may seem absurd to stress this point, but having seen the most minute errors cause styes, cysts, migraine, blepharitis, and conjunctivitis, it has been interesting to find them clear up after a proper correction when the usual local treatments gave only temporary relief.

Gastric Carcinoma after Gastro-enterostomy

Professor Seymour Barling writes: In the *Journal* of October 5th (p. 650) "D. V." asks for suggestions in the case of a patient presenting general failure of health with local symptoms fourteen years after a gastro-enterostomy who was satisfactory up to a short time ago. If, as he states, jejunal ulcer is absent, the possibility of gastric carcinoma must be borne in mind; for, though this is said to be rare under the circumstances, I have met with the complication twice recently, and the clinical picture is a very indefinite and misleading one owing to the presence of the stoma, and radiographic, chemical, and clinical findings must be interpreted in the light of the altered physiology of the stomach. The presence of a tumour or of occult blood would be strongly suggestive, whilst the radiographic examination must be undertaken with this possible complication in mind.

LETTERS, NOTES, ETC.

Faraday's Eyesight and the "Blind Spot"

A paragraph in *Nature* of January 12th referred to an entry in Faraday's diary of date January 15th, 1835, in which Faraday mentioned "a slight obscurity of the sight of my left eye." Dr. Frank Marsh, in a letter published in the *British Medical Journal* of September 28th, suggests that Faraday had discovered his physiological blind spot. A note in *Nature* of October 5th points out that Dr. Marsh's suggestion that the blur in Faraday's vision was due to his blind spot is not satisfactory for several reasons. "Faraday describes it as a 'slight obscurity of the sight,' that is, it was a definite blur—in ophthalmological phrase, a *positive* scotoma. The blind spot causes a hiatus in vision, but no positive blur; in other words, causes a *negative* scotoma. Apparently the blur was first noticed when Faraday used both eyes in reading, though it is not definitely stated that the right eye was open. If both eyes were being used the blind spot would not be noticed in reading. Moreover, the size of the scotoma ('about half an inch in diameter') does not correspond with the visual angle subtended at the nodal point of the eye by the normal blind spot. Faraday's description is meticulously accurate, as one would expect from him, and it is unlikely that he would write 'to the right and below the axis of the eye' if the true projection were to the left, as would be the case for the blind spot. It is probable that Faraday had a temporary retinal lesion, possibly a small retinal haemorrhage, and that this accounted for the obscurity he described. In concluding his letter Dr. Marsh asks whether Faraday's entry was the earliest reference to observations on the physiological 'blind spot.' It was certainly not; for in the second volume of the *Philosophical Transactions* it is recorded that Mariotte demonstrated the blind spot to the Royal Society before King Charles II in 1668."

Motor Car Insurance

"Clifton," in the course of a letter describing some personal experiences, makes the sensible suggestion that all medical men should carefully study the terms of their motor car insurance policies when these are first issued to them, so that there may be no possibility of misunderstanding with regard to the cover afforded. He suggests that it might be wise in these days to have cover against legal costs in the higher courts.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 50, 51, 52, 53, 54, 55, and 58 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 56 and 57.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 172.